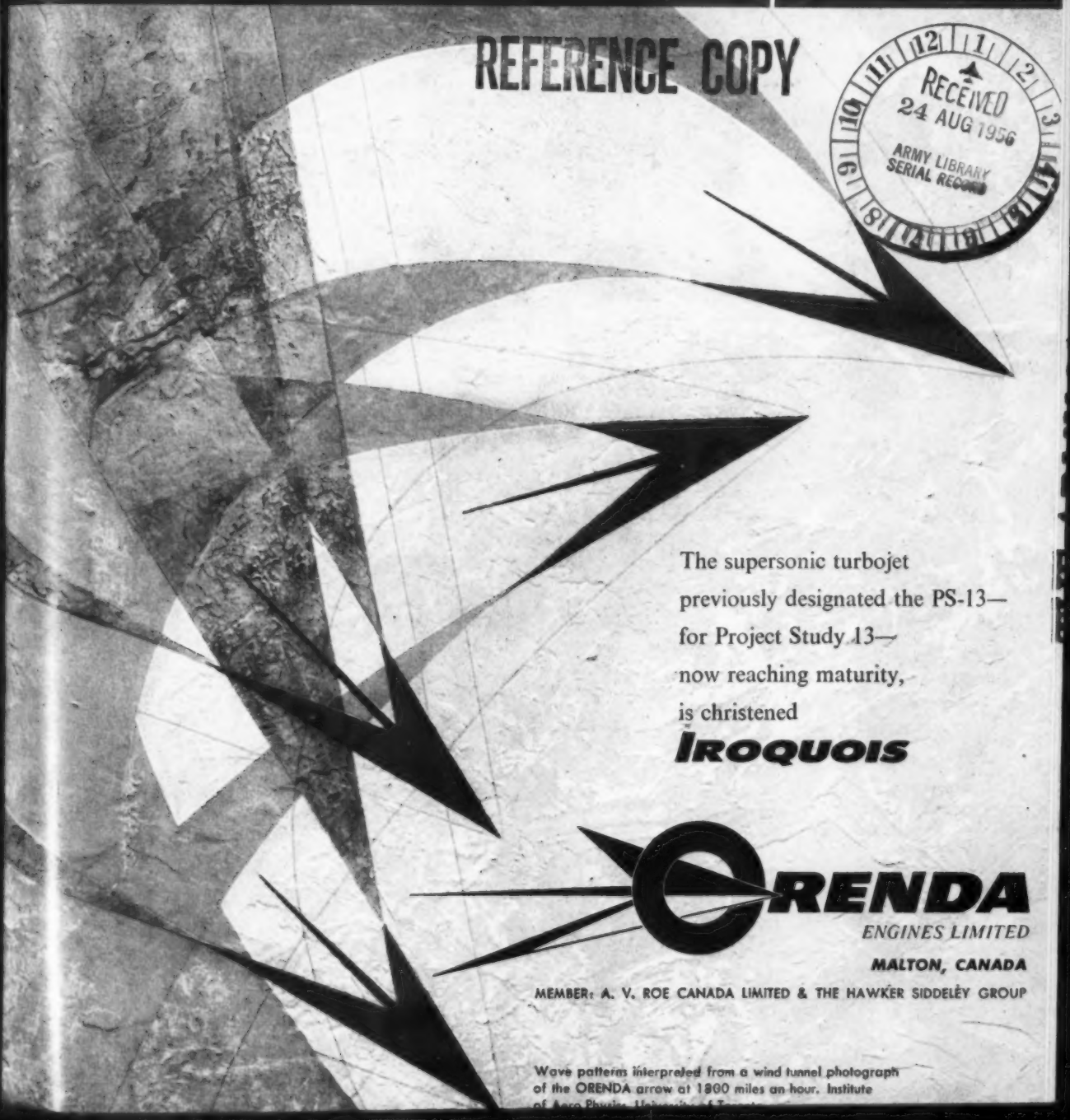
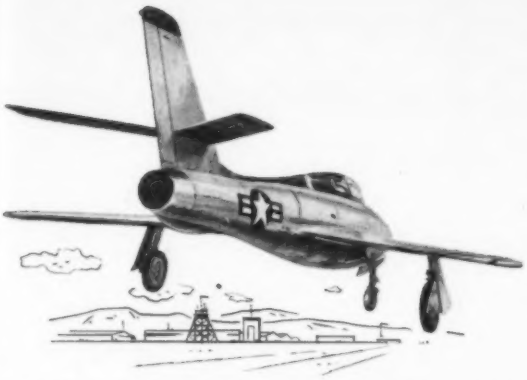
American Aviation

AUGUST 27, 1956

MANAGEMENT
ENGINEERING
PRODUCTION
OPERATIONS
MAINTENANCE
EQUIPMENT

50 cents





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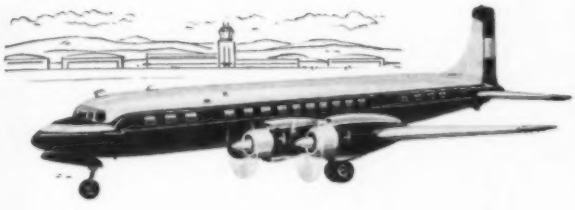

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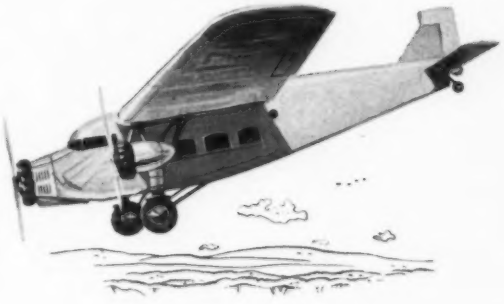

4.

Which airplane has the Disc-Type Brake?

Here they are: a jet, a helicopter, a huge modern transport and a famed early tri-motor. Which flies the disc-type brake, the famed braking principle developed by Goodyear for the aeronautics industry?

Ready with your answers? Here they are:

1. REPUBLIC F-84F—this famous jet is equipped with Goodyear Disc Brakes of the *Internal Type*, great brakes engineered for hot, high-speed landings.

2. SIKORSKY S-58—this helicopter uses Goodyear Brakes of the *Single Disc Type* in two applications: on the landing gear and on the rotor as well. You'll find Goodyear Disc Brakes on virtually every helicopter made today.

3. DOUGLAS DC-7C—this fast-flying airliner is a pioneer of something brand-new in super-efficient braking. Yes! They're Goodyear Disc Brakes of the new *Tri-Metallic Type*—engineered with the highest energy absorption capacity per pound of metal yet produced. Especially designed for high-capacity, weight-savings applications.

4. FORD TRI-MOTOR—this famous aircraft has a history of great service stretching back over three decades. Many were modified to utilize the Airwheel and a new braking principle developed by Goodyear at that time. The principle? *Multiple Disc Braking!*

In short, all of the aircraft shown here rely on Disc-Type Brakes built by Goodyear—as do a majority of the aircraft throughout the world.

The adaptability of the famed Goodyear principle, the almost limitless variations of the Disc Brake—and its complete dependability—have made it foremost in flying. It is convincing proof of the fact that Goodyear can engineer—for any aircraft—the most efficient brake with the desired characteristics and capacities.

Goodyear, Aviation Products Division,
Akron 16, Ohio, and Los Angeles 54, California

FACILITIES + ABILITIES
= EXTRA *plus* IN
PERFORMANCE

GOODYEAR
AVIATION
PRODUCTS

Airwheel—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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OTHER PUBLICATIONS AND SERVICES

American Aviation Daily: Daily News service for the entire industry. $200 per year. Managing Editor—Keith Saunders.

American Aviation World-Wide Directory: Twice-yearly listing of products, people, and organizations. $7.50 each. Managing Editor—Marion E. Grambow.

Official Airline Guide: Monthly publication of airline schedules, fares, World-Wide Edition: $19.50 per year, everywhere, North American Edition: $13.50 per year in USA; $14.00 in Canada; $15.00 elsewhere. Published from 139 N. Clark St. Chicago 2, Ill. Phone: Central 6-5804. Managing Editor—Robert R. Parrish.

Air Traffic News (Incorporating Air Traffic Digest): Daily rates and tariff news. $200 per year. Managing Editor—Mary Miller.

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Air Information Divisions: 595 Broad Avenue, Ridgefield, N. J. Phone: Whitney 5-8850-1. Director—Edward H. Henkler.

Who's Who in World Aviation: First Edition Over 2,000 biographies of aviation's leaders. 345 pp. Deluxe bound. $10.00 per copy, postpaid.

When & Where

AUGUST

Aug. 27-29—Association for Computing Machinery national meeting, University of California, Los Angeles.

SEPTEMBER

Sept. 1-3—1956 National Aircraft Show, Will Rogers Field, Oklahoma City.
Sept. 3-9—Society of British Aircraft Constructors exhibition and flying display, Farnborough, England.
Sept. 6—Sixth annual Airwork-Pratt & Whitney Aircraft engine operation and maintenance forum, Millville, N. J.
Sept. 9-11—International Northwest Aviation Council convention, Boise, Ida.
Sept. 10—Pratt & Whitney-Southwest Airmotive Co. engine forum, Melrose Hotel, Dallas.
Sept. 13—Airwork-Pratt & Whitney Aircraft engine operation and maintenance forum, Miami, Fla.
Sept. 14-15—Conference on Communications, Roosevelt Hotel, Cedar Rapids, Iowa.
Sept. 17-21—Annual general meeting International Air Transport Assn., Edinburgh, Scotland.
Sept. 18—Third Air Navigation Conference, Montreal.
Sept. 18-20—Twenty-Fourth USAF-Aircraft Industry flying safety conference, Santa Barbara, Calif.
Sept. 24-26—American Rocket Society, fall meeting, Hotel Statler, Buffalo, N. Y.
Sept. 25-29—International Association of Aircraft Constructors jet transport conference, The Hague.
Sept. 29—USAF Class 41-G reunion, Officers Club, Bolling AFB, D. C.

OCTOBER

Oct. 1-3—National Association of State Aviation Officials annual meeting, Lake Placid, N. Y.
Oct. 1-3—National electronics conference and exhibition sponsored by AIEE, IRE, Illinois Institute of Technology, Northwestern University and University of Illinois, Hotel Sherman, Chicago.
Oct. 1-3—Canadian IRE convention and exposition, Automotive Building, Exhibition Park, Toronto, Canada.
Oct. 2-4—1956 Aircraft Spark Plug and Ignition Conference, sponsored by Champion Spark Plug Co., Secor Hotel, Toledo, Ohio.
Oct. 2-6—SAE National Aeronautical Meeting, Aircraft Production Forum and Engineering Display, Hotel Statler, Los Angeles.
Oct. 3-5—Seventh annual National Airports Conference, University of Oklahoma, Norman, Okla.
Oct. 7-9—American Helicopter Society western forum, Adolphus Hotel, Dallas.
Oct. 8-10—Second annual symposium on aeronautical communications sponsored by IRE, Hotel Utica, Utica, N. Y.
Oct. 10-12—SAE National Transportation Meeting, Hotel New Yorker, New York.
Oct. 10-12-16—NACA triennial inspection, Langley Aeronautical Laboratories, Langley, Va.
Oct. 13-20—Eighth Annual All-Texas Air Tour, headquarters Walton Bldg., Austin, Tex.
Oct. 15-19—Second annual world-wide conference of USAF flying safety officers, Keesler AFB, Biloxi, Miss.
Oct. 16-18—Conference on magnetism and magnetic materials, sponsored by IRE, AIEE, APS and AIMMEE, Hotel Statler, Boston.
Oct. 22-23—Radio Technical Commission for Aeronautics fall meeting, Hotel Marrott and CAA Technical Development Center, Indianapolis.
Oct. 23-25—National Business Aircraft Association 9th annual meeting and forum, Miami, Fla.
Oct. 25-26—Aircraft Electrical Society annual display of electrical equipment, Pan-Pacific Auditorium, Los Angeles.
Oct. 29-30—Third annual East Coast Conference on Aeronautical and Navigational Electronics, sponsored by IRE, 5th Regiment Armory, Baltimore.

NOVEMBER

Nov. 1-3—National Aviation Trades Association annual convention, St. Louis.
Nov. 8-9—SAE national fuels and lubricants meeting, Mayo Hotel, Tulsa, Okla.
Nov. 14-15—Aircraft Industries Association export conference, Miami Beach, Fla.

Rascal

longer "reach" for the Air Force

Guided missiles, a fantasy yesterday, are a working reality today. One of the most important concepts in this field is the GAM-63 Rascal, a USAF air-to-surface missile for which Bell Aircraft Corp. has the weapon system responsibility.

Rascal is designed to be carried aloft by USAF strategic bombers and released miles from its objective. Even while the bomber is on the return flight to its home base, Rascal is heading at a high speed and with pin-point accuracy to its target.

The rocket-powered Rascal not only can increase the "reach" of the Air Force but also could eliminate the hazardous "run over the target" for airmen and extend the useful life of the nation's bombardment aircraft.

As the prime contractor, Bell Aircraft has been associated with a large segment of U. S. Industry in developing the entire Rascal weapon system. This system includes the airframe, guidance, rocket engine, servomechanical devices, launching and ground support equipment, flight testing and training.

BELL
Aircraft CORP.
BUFFALO, N. Y.

The Air Force-Industry team urgently needs scientists and engineers for projects vital to the nation's defense. Opportunities to make important contributions are offered in military or civilian careers.

Personal View

By WAYNE W. PARRISH

The Penalty for Going First Class

(or: Carl Hinshaw was Right)

CARL HINSHAW collapsed from exhaustion on the closing day of Congress late in July and died a week later. The Republican Congressman from California was the most knowledgeable authority on aviation on Capitol Hill. He will be greatly missed. He was a severe critic but a devoted friend of the entire aviation business and his contributions to its welfare and advancement were legion.

One of his last public pleadings was on an unusual subject. It was the 40-lb. free baggage allowance for domestic airline passengers. Carl Hinshaw was an expert on nuclear energy, military aviation and the technical intricacies of airways traffic control, but his breadth of knowledge and interests in all things aviation was demonstrated by his delving into discriminatory features of the baggage allowances for domestic air travelers as opposed to international.

Carl Hinshaw will not again be able to take up his baggage crusade. It is doubtful that the joint resolution which he introduced last session to implement his crusade will be re-introduced next session by a colleague. But we think the air transport industry should take positive steps without the need for governmental action.

Like Carl Hinshaw, we think the 40-lb. free baggage allowance for first class passengers is as antiquated as the original transport airplanes which warranted the strict free weight limit.

Any passenger with an international ticket, whether he be going to or from Europe, Cuba, Mexico or any other foreign point except Canada (but including Hawaii and Alaska can take with him 66 lbs. of baggage without extra charge. No questions asked. But the airline passenger traveling exclusively within the U.S. and Canada, whether he travel by first class or coach, must pay a rather hefty excess baggage charge for every pound over 40.

Carl Hinshaw dug up enough facts and figures to make the air transport industry blush collectively. A Washingtonian going to Miami with 66 lbs. of baggage had better play safe and buy a round-trip to Havana with stopover privileges in Miami if he thinks he might go to Cuba, else he's going to be out some money. With a Havana ticket he can carry 66 lbs. of baggage both ways with no questions asked. (He probably could collect a refund if he doesn't go to Havana!)

If a Washingtonian is going to Los Angeles and back with 66 lbs. of baggage he's in for a substantial excess baggage charge. But he can take a sideline trip of 2,906 miles extra to Mexico City on the way to Los Angeles for an additional fare of only $20 ($.007 per mile) and have no excess baggage charges because his ticket is international.

There was a time in the early days of the business when every pound of payload had to be counted exactly. Passengers and all their belongings were weighed carefully. That was when weight was an exact safety and performance factor on short-range airplanes. A passenger with a lot of baggage was likely to offload express or maybe even a late-arriving passenger, and he was, and should have been, charged accordingly.

Nowadays excess baggage is a gimmick to increase revenues by those carriers who care to risk making passengers angry. We are talking about the excess that amounts to three, five, ten and fifteen pounds. Obviously a passenger with 115 lbs. of baggage should pay extra, but the 40-lb. limit is as antiquated as can be.

Some airlines blink at a few extra pounds. Others don't. So variable have been the practices that the ATA has installed an enforcement section to see that all lines adhere strictly to the regulations. How much simpler it would be to increase the first-class passenger baggage allowance to the standard international limit of 66 lbs.

Recently we made a transcontinental trip involving six separate check-ins on three different carriers. On the first three flights on two carriers the question of excess on one bag and one briefcase never arose. With the third carrier there was no excess charged on the first leg. On the second leg there was 3 lbs. excess on the bag but the briefcase was not questioned. On the third leg the briefcase weight was requested and an excess charge made for 12 lbs. Such situations for passengers buying first-class tickets are not only irksome but indicate that the industry hasn't become realistic in its relations with the public.

It is manifestly bad business for industry when a counter agent for one airline says "the law" requires brief cases to be weighed (as happened on our recent trip) when the counter agent of another airline suggests that we not check brief cases and small bags else he will have to weigh them.

Increasing the first-class allowance to 66 lbs. certainly doesn't alter the weight factor, although the airlines might get additional business from those who take the train or drive their own car because of the present low free baggage allowance. What it *would* do is to demonstrate that the domestic airlines are in the *transportation* business catering to all manner of passengers with a realistic appreciation of the fact that vacationists and business people on long trips cannot limit themselves at all times to 40 lbs. and who resent the last-minute payment at the check-in counter when they've already laid out a sizable sum for basic transportation.

A fitting memorial to Carl Hinshaw would be positive action on one of his latest crusades.

NORTHWEST AIRLINES

thinks of everyone with Sperry

equipment for new DC-6Bs and DC-7Cs

SPERRY ENGINE ANALYZERS enable precise tune-ups before take-off and constant study of all ignition operations during flight...

SPERRY DUAL INTEGRATED INSTRUMENT SYSTEMS combine major flight instrumentation into 3 instruments providing more flight data in clear visual form.

SPERRY FLIGHT CONTROL SYSTEMS combining the A-12 Automatic Pilot and Radio Beam Coupler hold true courses, assure precision automatic approaches.

"On-Time" departures and arrivals—no delays while mechanics search for elusive engine troubles through old "trial and error" methods.

Precision instrumentation gives skilled pilots precise flight data regardless of weather, building traveler confidence.

A *smooth* ride, increased confidence, and additional assurance of "arrival on time."

PASSENGERS BENEFIT...

Exact knowledge of engine performance at all times permits better adjustments in flight, accurate pinpointing of troubles assuring quick repairs upon landing.

Split-second knowledge of all major flight conditions through three instruments.

Conserves energies, allows more time to monitor the overall flight.

CREW BENEFITS...

Accurate schedules attract more passengers. Better performance cuts operating costs, reduces replacement parts, prolongs life of equipment.

Added security in careful handling of a major investment —the plane itself.

Further protection of investment—and further guarantee of passenger good will and preference.

AIRLINE BENEFITS...

To list the airlines specifying Sperry Flight Control Systems and Sperry instrumentation would be to list "Who's Who in Commercial Aviation." For information on all Sperry developments including the new Sperry SP-30 Flight Control System for jet and turboprop transports—write our Aeronautical Equipment Division or nearest district office.

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Washington Report

No Brake on Executive Salaries

Don't look for any drastic new restrictions on the compensation of executives of aircraft companies and other defense contractors, despite recommendations of Rep. F. Edward Hebert's (D-La.) House Armed Services Investigations Subcommitee.

Defense Department has been working for many months on new cost principles to govern compensation of executives of companies supplying the government under cost-reimbursable-type contracts. Task is part of an overall revision of Armed Services Procurement Regulation.

Hebert subcommittee advised Pentagon to establish a "reasonably conservative" salary allowance schedule for executive compensation and to require companies to pay excess compensation from their own profits instead of charging it to general overhead of their contracts.

Despite this proposal, it is understood a "formula" controlling executive compensation is unlikely. Defense officials hope instead to put more emphasis on need for reasonableness and allocability of compensation in given contracts while leaving large amount of discretion with individual contract officers.

When new revisions will appear is not certain, although 30 to 60 days has been suggested.

New Pentagon Security Clamp

Signs of a new freeze on flow of military information are apparent at Pentagon as a result of Defense Secretary Charles Wilson's recent action to halt leaks of secret documents and other classified information to the press.

Defense chief set up a committee, headed by his special assistant, Charles Coolidge, to study problem of safeguarding military information, including evaluation of present security laws and procedures. Group may recommend more vigorous machinery to "fix responsibility" for leaks.

"Over the past several months, classified documents, staff studies and other classified military information have been disclosed to unauthorized persons," Wilson wrote Coolidge. "In the interest of national security, this must stop." He apparently was referring to recent appearance in the *New York Times* of Army and Air Force staff studies dealing with interservice differences.

Drive to tighten security was not the only evidence of an information slowdown. Two generals reportedly associated with recent leaks were transferred out of Washington: Brig. Gen. Lyal Metheny, USA, whose office is reported to have given Army staff studies to newsmen, and Brig. Gen. Robert Scott, USAF Director of Information Services.

Metheny will head the Florida Military District dealing with reserve affairs, while Scott will command a crew training wing at Luke AFB, Ariz.

Newsmen also detected increased reticence on part of normally accessible sources, and there were reports of stronger efforts by Defense Department to track down source of stories disclosing military decisions in advance of their announcement through regular channels.

What Price Traffic Controllers?

Civil Aeronautics Administration battle with Civil Service Commission over grading of tower and center controllers should be compromised by end of next month.

CAA is handicapped by complete lack of understanding on part of CSC representatives as to the highly technical role of controllers.

Here's how matters stood last week:

- Civil Service agrees in principal to upgrading of supervisory control tower operators in high-density areas, based on CAA's 200,000 instrument movements a year criteria. But Commission won't go along on applying same criteria to working-level and assistant controllers. CAA wants criteria tied to all controller levels.
- Upgrading of high-density center operators is in the "studying stage," with CSC pondering CAA justifications for the new grades.
- Commission refuses to budge on its intent to downgrade low-traffic towers. More than 35 towers are involved. CAA proposes a two-year delay in implementing this standard in order to train replacements at the lower grade while transferring experienced controllers to higher traffic or new towers. Controllers would not be penalized salary-wise if they chose to remain at lower grade.

Air Transport Assn., Air Traffic Control Assn. and Air Line Pilots Assn. are assisting CAA.

GOP to Control CAB Until '59

Should the Democrats win the presidential election this year, they will be faced with prospect of a Republican-dominated Civil Aeronautics Board until 1959. Only resignation of one of three present Republicans prior to completion of term would permit a Democratic majority.

Democrat Joseph P. Adams holds the only Board membership up for grabs this year. Thus, a potential Democratic president could reappoint Adams or substitute another Democrat, but could effect no change in the majority. No Board memberships expire in 1957. The first Republican's term to expire will be that of ex-Sen. Chan Gurney on Dec. 31, 1958.

End of Tacan Wrangle in Sight

Look for final decision in the two-year-old Tacan-DME battle shortly after Labor Day. Louis S. Rothschild, Air Coordinating Committee chairman, has called a top ACC meeting August 30, following receipt last week of the NAV Panel report.

NAV Panel, according to reliable sources, arrived at a single report, rather than the expected split. This will make top ACC deliberations considerably simpler.

What to expect: A decision not completely satisfactory to all elements, but an acceptable compromise. This would forestall a ruling from the White House.

Business flies his way!

E. Merritt (Andy) Anderson, Shell Aviation Dealer at General Mitchell Field, Milwaukee, has a knack for making friends and making money. Maybe that's because he keeps so busy.

Meet Andy Anderson—aircraft salesman. Andy first tried his hand at selling airplanes as a distributor for a popular airplane manufacturer and has consistently been on the "Top Ten" list of leading salesmen for this make.

Meet Andy Anderson—instructor in flying. When you love flying as much as Andy, it's only natural for you to pass on your enthusiasm. So Andy established a glider school and a student training center in Wisconsin plus a primary flying school in Missouri to help hundreds of young pilots.

Meet Andy Anderson—flying ambassador. Andy goes everywhere in his own plane . . . signing up new clients . . . looking after all the Anderson interests.

Meet Andy Anderson—Shell Aviation Dealer. Andy's first big success was with Shell. His company, Anderson Air Activities at General Mitchell Field, Milwaukee, was formed in 1941. Today it's a round-the-clock operation, servicing four major airlines, an Air Force reserve unit, a National Guard squadron and a host of private and corporate planes.

And more and more business keeps flying

Andy's way. It's no wonder! He has a sure-fire sales-building approach—"Give 'em what they want . . . *on-schedule* service."

With a full line of Shell Aviation products in the shop, the very latest Shell equipment on the runways and the Shell Aviation Credit Card system to save the flier even *more* time, AAA is equipped to service anything that flies . . . quickly, efficiently.

For example, the daily routine includes preparing a giant airliner for a "cross-country hop" . . . getting a corporate flier off on schedule for an appointment in Cleveland . . . refueling Air Force jets for patrol duty . . . checking and servicing a private plane before it takes off on a weekend jaunt.

AAA has to keep up with the latest service methods, too. It depends upon frequent visits from the Shell aviation specialist plus merchandising hints in the Shell Dealer magazine to keep abreast of what's new in runway service.

Since he became a Shell Aviation Dealer, Andy has boosted his gallonage almost three thousand per cent. No doubt about it—Andy Anderson sells for Shell and does a fine job. But Andy, himself, has said, "Shell sells for me!" And he can prove it.

With the latest Shell equipment on the runway, AAA gives these Air Force jets quick, efficient service.

Private fliers like the way AAA rolls out the red carpet as soon as they roll in.

AAA (Anderson Air Activities) helps major airlines meet split-second schedules with efficient, *on-schedule* service.

Dependable Shell aviation products in the shop help AAA do an A-1 job on repairs.

It pays to be a Shell Aviation Dealer

—and the Shell office nearest you will be glad to show you why

SHELL

Industry News Digest

Air Materiel Command in Market For Two New Jet Support Aircraft

USAF Air Materiel Command is staging competitions for the design and construction of prototypes of two new jet support aircraft: a twin-jet pilot readiness trainer and a four-jet utility transport.

In its letter announcing the competitions, AMC gave these specifications and performance requirements:

• **Twin-jet trainer**—Crew of two plus at least four passengers; primary mission to be combat readiness training; combat range of 1,500 nautical miles; service ceiling of 40,000 feet at design takeoff weight; maximum cruise altitude of 45,000 feet; critical field length of 5,000 feet using maximum power; landing ground roll of 2,500 feet using one-half fuel, and a cruise speed of Mach 0.76 (500 to 570 mph, depending on altitude and temperature).

• **Four-jet transport**—Crew of two and capacity for at least eight passengers; primary mission of delivering critical documents and high-priority cargo; combat range of 1,500 nautical miles with an extended range of 2,200 nautical miles against a 70-knot headwind with a 30-minute fuel reserve at sea level; service ceiling of 40,000 feet at design takeoff weight; maximum cruise altitude of 45,000 feet; critical field length of 5,000 feet with 8,000 feet for extended range; landing roll of 2,500 feet and a cruise speed of Mach 0.76.

"The feasibility of the entire program . . . depends on the aircraft industry producing flying articles which are acceptable for evaluation and which are producible at minimum cost in the event of acceptance for production," AMC said. It suggested a flyaway price of $200,000 for the twin-jet trainer and $400,000 for the four-jet transport.

Companies interested in developing either or both aircraft with their own funds were asked to indicate their willingness to participate within 60 days. AMC said it would like to know the approximate date when prototypes and data will be available for inspection, evaluation and flight test. In event of more than one acceptable prototype in each category, it said, "formal procedures will be employed by a joint AMC-ARDC weapons system evaluation team leading to the selection of production contractors."

AMC based its decision to follow a "fly-before-we-buy" policy on three factors:

• **Limited USAF R&D funds** should be spent on basic research and combat equipment rather than supporting systems.

• **A potential commercial** market exists for the two types of aircraft.

• **Costs of developing** the new aircraft models are within reach of the industry.

Fairchild Engine & Airplane Corp. is known to be building an M-185 aircraft with its own funds. It has been reported to have a passenger capacity of seven or eight. It may be powered by four Fairchild J83 engines of 2,000 pounds thrust each. A company spokesman said Fairchild will have an entry that "comes close" to meeting AMC specifications, but he did not identify it as the M-185.

Other companies which might be expected to participate in the competitions include Temco, Beech, Cessna, Northrop, Republic and North American. Little interest is expected from Boeing, Douglas and Lockheed. A number of proposals for small jet transports are known to be circulating within industry, but it is believed that Fairchild is the only company now building such an aircraft with its own funds.

CAA Lists 298,076 Active Civil Pilots

There were 298,076 active civil pilots in the U.S. as of January 1, according to CAA's first complete count of pilots with current medical certificates. The accurate count was the culmination of a four-year program which collated medical certificates with the 724,638 pilot certificates on file.

Breakdown by category revealed that there are 80,494 student pilots; 132,525 private pilots; 72,957 commercial pilots, and 11,774 airline transport rated pilots. Of the active pilots, 19,741 hold instrument ratings and 28,018 are rated as flight instructors. One hundred pilots hold helicopter ratings only and about 3,000 certificated fixed-wing pilots are rated also for helicopters.

Boeing Orders Sperry, Bendix 707 Systems

First orders by Boeing Airplane Co. for instrument systems and autopilots have been announced by two electronics firms.

• Sperry Gyroscope Co., division of Sperry-Rand Corp. received an order for 12 "integrated instrument systems" slated for installation in Pan American World Airways' 707s. Deliveries to Boeing are to start early next year.

• Bendix Eclipse-Pioneer revealed a $2.5-million order for an undisclosed number of PB-20 autopilots for delivery beginning in April 1957. First units are to be installed in 707s ordered by American and Trans World Airlines.

New Sting for Northrop Scorpion

Six Hughes Falcon guided missiles have been added to fire power of the Northrop F-89H Scorpion. Three missiles are mounted in each of the big wingtip pods, which also carry a total of 42 air-to-air rockets (2.75s) internally. Falcons are carried inside pod until ready for use, then are extended as shown.

CAA Lists Locations of New (1957) Navigation, Traffic Control Facilities

CAA has released the listing of the locations to receive new navigation and traffic control facilities in its fiscal 1957 program. The program calls for installing long-range radar at 26 locations, in addition to units in New York and Washington and new ones scheduled for commissioning at Norfolk, Va., September 1 and at Chicago November 30.

In addition, CAA will establish 82 VORs; 17 new control towers; 19 high intensity approach lighting systems; and additional air-ground communication frequencies at 34 airports. A new air route traffic control center will be established at Phoenix and airport surveillance radar will go into Miami and Colorado Springs. Locations for each facility is as follows:

LONG-RANGE RADAR—Albuquerque, N.M.; Atlanta, Ga.; Boston, Mass.; Buffalo, N.Y.; Cleveland, O.; Denver, Colo.; Detroit, Mich.; El Paso, Tex.; Ft. Worth, Tex.; Houston, Tex.; Indianapolis, Ind.; Jacksonville, Fla.; Kansas City, Mo.; Los Angeles, Calif.; Memphis, Tenn.; Miami, Fla.; New Orleans, La.; Oakland, Calif.; Phoenix, Ariz.; Pittsburgh, Pa.; St. Louis, Mo.; Salt Lake City, Utah; San Antonio, Tex.; Seattle, Wash.; Spokane, Wash.; and additional radar information will be piped into the New York Center from a long-range Navy radar at Atlantic City, N.J.

VOR OMNIRANGES—Agricola, Ga.; Akron, O.; Atloona, Pa.; Astoria, Ore.; Austin, Nev.; Basolt, Nev.; Beatrice, Nebr.; Bishopville, Md.; Blackwells Corner, Calif.; Burlington, Vt.; Canton, O.; Carrollton, Mo.; Cayutaville, N.Y.; Charlestown, W. Va.; Cincinnati, O.; Clarksburg, W. Va.; Cody, Wyo.; Coles Point, Va.; Keene, N.H.; Knobnoster, Mo.; Lakeview, Ore.; Lancaster, Pa.; Liberty, N.Y.; Manchester, N.H.; McCall, Ida.; McCracken, Pa.; Milford, Dela.; Miami, Fla.; Molokai, T.H.; Mooresville, Mo.; Newcomerstown, O.; Newhall, Calif.; New Madison, O.; Northfield, Vt.; O'Neill, Nebr.; Oshkosh, Wisc.; Coxcomb, Calif.; Crandall, Tex.; Decatur, Ill.; Del Rio, Tex.; Detroit City, Mich.; Edenville, N.Y.; El Centro, Calif.; El Creek, Wash.; Elgin, Wash.; Ethel, Wash.; Evanston, Ill.; Farallon Islands, Calif.; Fern Prairie, Wash.; Flint, Mich.; Fowlerville, N.Y.; Gilroy, Calif.; Gulfport, Miss.; Hickory Grove, Pa.; Hog Island, Va.; Huntington, W.Va.; Hyannis, Mass.; Jamestown, N.Y.; Jefferson, Mo.; Princeton/Bluefield, W.Va.; Polvardero, N.M.; Rainelle, W.Va.; Richland Center, Ind.; Richmond, Ind.; Rock Springs, Ariz.; San Bernardino, Calif.; Sandusky, O.; Shelbyville, Ind.; Shipman, Ill.; Show Low, Ariz.; Sidney, N.Y.; Sparta Junction, N.J.; Sweetvalley, Pa.; Springville, Pa.; Vesta, Va.; Walhalla, S.C.; Warm Springs, Nev.; Waterville, S.C.; Wellsville, N.Y.; Westfield, Mass.; Williamsport, Pa.; and Zanesville, O.

NEW CONTROL TOWERS—Westfield, Mass.; Salem, Ore.; Erie, Pa.; Utica, N.Y.; Columbus, Ga.; Longview, Tex.; Fargo, N.D.; St. Joseph, Mo.; Santa Fe, N.M.; Fayetteville, N.C.; Stockton, Calif.; Lynchburg, Va.; Worcester, Mass.; Lafayette, La.; Macon, Ga.; Rockford, Ill.; and Hobbs, N.M.

AIR/GROUND COMMUNICATIONS CHANNELS FOR TRAFFIC CONTROL (ADDITIONAL)—Buffalo, N.Y.; Charleston, W.Va.; Columbus, O.; Cincinnati, O.; Houston, Tex.; Knoxville, Tenn.; Nashville, Tenn.; San Antonio, Tex.; Austin, Tex.; Mobile, Ala.; Raleigh-Durham, N.C.; Chicago (O'Hare), Ill.; Detroit City, Mich.; Omaha, Nebr.; Burbank, Calif.; Long Beach, Calif.; Honolulu, T.H.; Louisville, Ky.; New York (Idlewild), N.Y.; Windsor Locks, Conn.; Birmingham, Ala.; Baltimore, Md.; Norfolk, Va.; Wilkes-Barre, Pa.; Bristol, Tenn.; Chattanooga, Tenn.; Greensboro, N.C.; Greenville, S.C.; Savannah, Ga.; Charlotte, N.C.; Grand Rapids, Mich.; Lansing, Mich.; Madison, Wis.; Rochester, Minn.

HIGH-INTENSITY APPROACH LIGHT SYSTEMS—Albany, N.Y.; Charleston, W.Va.; Columbus, O.; Dayton, O.; Newark, N.J.; Austin, Tex.; Greensboro, N.C.; Indianapolis, Ind.; Ft. Wayne, Ind.; Billings, Mont.; Louisville, Ky.; Atlanta, Ga.; Birmingham, Ala.; Dallas, Tex.; Houston, Tex.; Nashville, Tenn.; St. Louis, Mo.; Burbank, Calif.; Spokane, Wash.

EQUIPMENT FOR ADDITIONAL STAFF AT 24 CENTERS—Boston, Mass.; New York, N.Y.; El Paso, Tex.; Jacksonville, Fla.; Miami, Fla.; San Antonio, Tex.; Detroit, Mich.; Kansas City, Mo.; St. Louis, Mo.; Denver, Colo.; Los Angeles, Calif.; Salt Lake City, Utah; Cleveland, O.; Atlanta, Ga.; Ft. Worth, Tex.; Memphis, Tenn.; New Orleans, La.; Chicago, Ill.; Indianapolis, Ind.; Minneapolis, Minn.; Albuquerque, N.M.; Great Falls, Mont.; Oakland, Calif.; Seattle, Wash.

AUTOMATIC WEATHER BROADCASTING EQUIPMENT—Millinocket, Me.; Knoxville, Tenn.; Garden City, Kans.; Indianapolis, Ind.; Omaha, Nebr.; Wichita, Kans.; Boise, Ida.; Miles City, Mont.; Birmingham, Ala.; Detroit, Mich.; Grand Marais, Mich.; Milwaukee, Wisc.; Rapid City, S.D.; Billings, Mont.; Denver, Colo.; Missoula, Mont.

CAB Approves IATA's New Fare Schedules

Civil Aeronautics Board last week approved new fare schedules of the International Air Transport Association and thus averted a threatened "open rate" situation this fall. But the agency conditioned its approval with a call to foreign governments to reconsider the basic IATA fare structures before next spring.

Board's approval action means present fare structures will continue in effect beyond September 30, deadline of a previous Board approval order. In addition, new 15-day round-trip tourist excursion fares will go into effect October 1, as agreed by IATA members at their Cannes, France, traffic meeting two months ago.

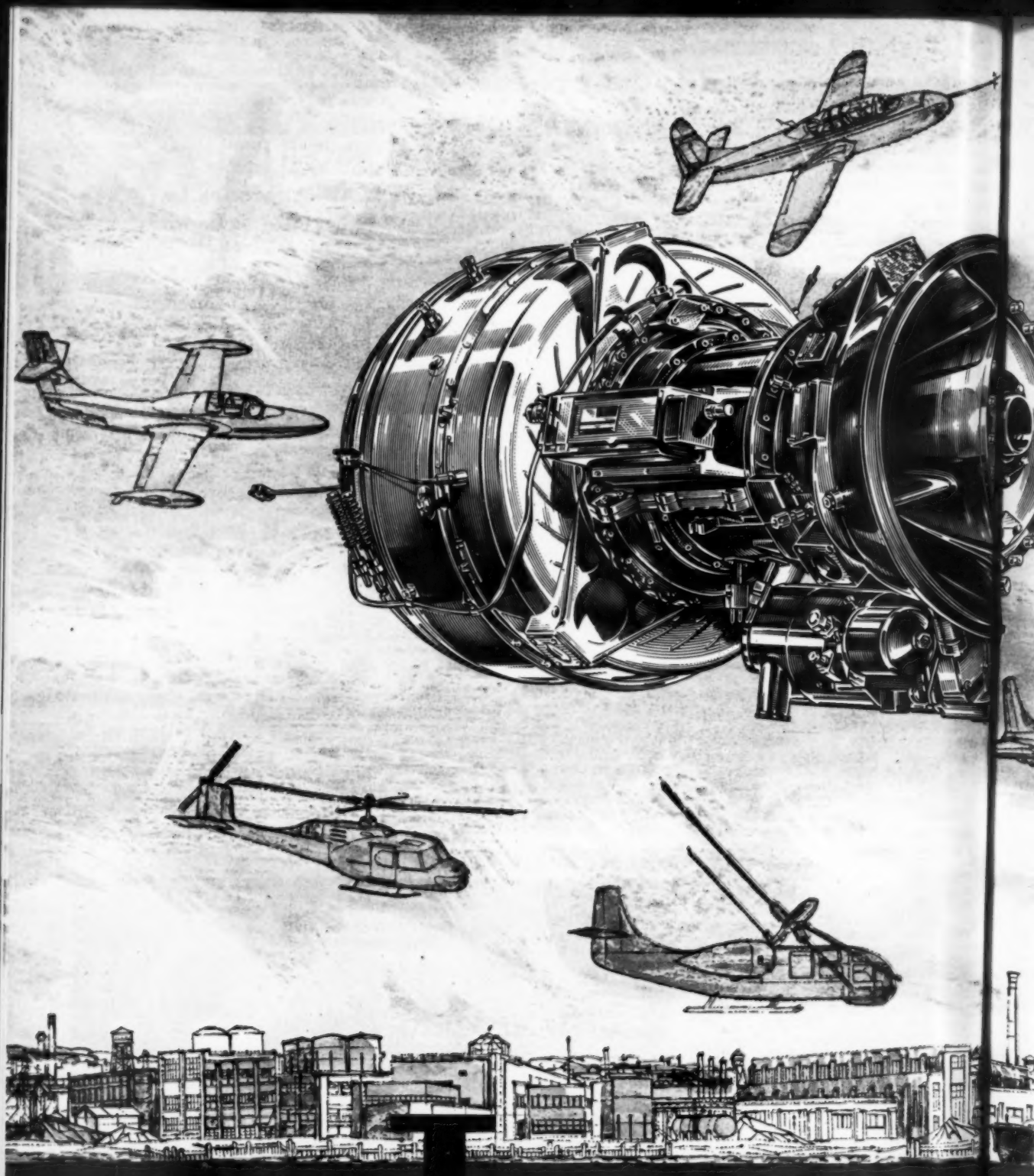
CAB's approval was half-hearted at best. The agency expressed disappointment that basic tourist fares will not be lowered until April 1, 1958, under new IATA resolutions. Proper increases in maximum seating densities would permit a 10% tourist fare cut now, the agency reasoned.

But it agreed to withhold its objections to see what develops in its proposed meetings with foreign governments.

(*More Industry News on page* 19)

Rockets Boost Valiant Takeoff Power

Two De Havilland Super Sprite rockets have been fitted to a British Vickers Valiant jet bomber for added takeoff power. Rockets are mounted under each wing. They are jettisoned by parachute between 700 and 1,000 ft.



avco

Lycoming

Avco Defense and Industrial Products combine the scientific and engineering skills, and production facilities of three great divisions of Avco Manufacturing Corp.: Lycoming; Research and Advanced Development; Crosley—to produce power plants, electronics, airframe components, and precision parts.

FROM AVCO LYCOMING— NEW MULTI-PURPOSE GAS TURBINE

There's a gas turbine running at Avco Lycoming, and it promises to power fixed wing aircraft, STOL aircraft, boats and tanks as they have never been powered before! Developed under the sponsorship of the U. S. Army and U. S. Air Force, the T53 has already been selected to power the Army's newest utility 'copter (Bell XH40).

Note these facts about the T53:

- *outstanding performance*—825 hp. in so little space (length: 47.6 in.; diameter: 23 in.). Only 460 lbs. Uses a variety of fuels including automotive and aviation types, gasoline and JP-4 with a low fuel consumption of 0.71 lbs. per hp. per hr.
- *minimum of critical materials*—assures availability of the engine even under emergency conditions!
- *rugged design features*—guarantee safe operation under the most grueling pressures, guarantee a long life for the engine.
- *unprecedented ease of maintenance*—entire power turbine and combustor may be removed as an assembly for inspection and maintenance in the field.
- *versatility*—available with front-end take-off or rear-end take-off or simultaneous power extraction at both ends.

The turbine age is here! Developed by the men who built the first mass-produced jet engine to fly—built by the manufacturer whose reciprocating engines drive more different types of fixed and rotary wing aircraft than any others in the world—Lycoming's T53 may solve your future power problems, *now!*

Phone, wire or write for turbine booklet to Avco Lycoming, Stratford, Conn.

defense and industrial products

TODAY'S MILITARY SERVICES, WITH THEIR TREMENDOUS TECHNOLOGICAL ADVANCES MADE POSSIBLE THROUGH SCIENCE, OFFER A VITAL REWARDING CAREER

Circle No. 7 on Reader Service Card.

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CLASSIFIED **Photoelectric Sextants** for remote semi-automatic celestial navigation.

CLASSIFIED **Automatic Astrocompasses** for precise automatic celestial directional reference and navigation.

Photoelectric Tracking Systems For many years Kollsman has specialized in high precision tracking systems.

Periscopic Sextants for manual celestial observations.

CLASSIFIED **Computing Systems** to provide precise data for automatic navigation and guidance, operated by optical, electromechanical, and pressure sensing components.

FOR CONTROL

proven components now in production

Pressure Pickups and Synchrotel Transmitters
to measure and electrically transmit • true airspeed • indicated airspeed • absolute pressure • log absolute pressure • differential pressure • log differential pressure • altitude • Mach number • airspeed and Mach number.

Pressure Monitors — to provide control signals for altitude, absolute and differential pressure, vertical speed, etc.

Acceleration Monitors — for many applications now served by gyros.

Pressure Switches — actuated by static pressure, differential pressure, rate of change of static pressure, rate of climb or descent, etc.

Motors — miniature, special purpose, including new designs with integral gear heads.

SPECIAL TEST EQUIPMENT
optical and electromechanical for flight test observations.

Please write us concerning your specific requirements in the field of missile or aircraft control and guidance. Technical bulletins are available on most of the devices mentioned.

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Circle No. 8 on Reader Service Card.

Industry News Briefs

(*Continued from page* 15)

MANUFACTURING

• **Air Materiel Command** awarded Boeing Airplane Co. contracts totaling $576,369,524 for an undisclosed number of additional B-52D bombers and spare parts. Boeing-Seattle contract amounted to $290,197,350, Boeing-Wichita's $286,172,174.

• **Five companies** now are studying "flying crane" helicopters, with Flettner Aircraft Corp., Kew Gardens, N. Y., and Kaman Aircraft Corp., Bloomfield, Conn., most recent army contract award winners. Piasecki Aircraft, Hughes Tool Co. and Hiller Helicopters received previous awards.

• **Col. J. Francis Taylor, Jr.,** whose resignation as director of Air Navigation and Development Board has been rumored some time (AMERICAN AVIATION, June 4, p. 11), has been assigned to 1800th AACS Wing Headquarters, Tinker AFB, Okla. D. K. Martin, deputy director of ANDB, is acting director.

FINANCIAL

• **Eastern Air Lines** reports net profit for first half of 1956 was $7.5 million, or $2.71 per share, compared with $4.175 million and $1.68 a share for same period of 1955. Gross revenues totaled $119 million, against $103 million last year.

• **Fairchild Engine & Airplane Corp.** earnings totaled $664,000 on sales of $69.5 million the first six months this year, compared with $2.1 million profit on $78.9 million the first half of 1955. Backlog at midyear: $200 million.

• **Grumman Aircraft Engineering Corp.** sales for first half of 1956 totaled $89.7 million, a drop from $115.1 million a year ago. Earnings were $4 million, or $1.86 per share, compared with $5.54 million and $2.52 a share in first half of 1955. Backlog June 30: $181.4 million.

• **United Aircraft Corp.** net income for six months ended June 30 was $20.6 million or $4.06 per share on consolidated sales of $458.5 million. This compares with $15.3 million earnings on $359.1 million sales and $3.02 per share a year ago.

• **Northwest Airlines** net profit to stockholders for year ended June 30 was $2.77 million, or $2.77 per share, compared with $2.73 million and $2.99 per share a year ago. Net income from operations was $1.96 million, against $2.77 million last year.

• **Capital Airlines** had a net loss of $1.6 million the first six months of 1956, compared with net profit of $3.5 million a year ago, despite more than $4 million increase in operating revenues. Latter increase was more than offset by drop in profits from equipment sales from $5.4 million the first half of 1955 to $662,170 this year. Cost of integrating Viscounts jumped extraordinary costs from $269,112 last year to $852,596.

• **Boeing Airplane Co.** sales totaled $407 million the first half of 1956, compared with $370 million a year ago. Net income: $14.5 million, or $2.22 per share, against $13.6 million and $2.09 a year ago. Backlog June 30: $2.6 billion.

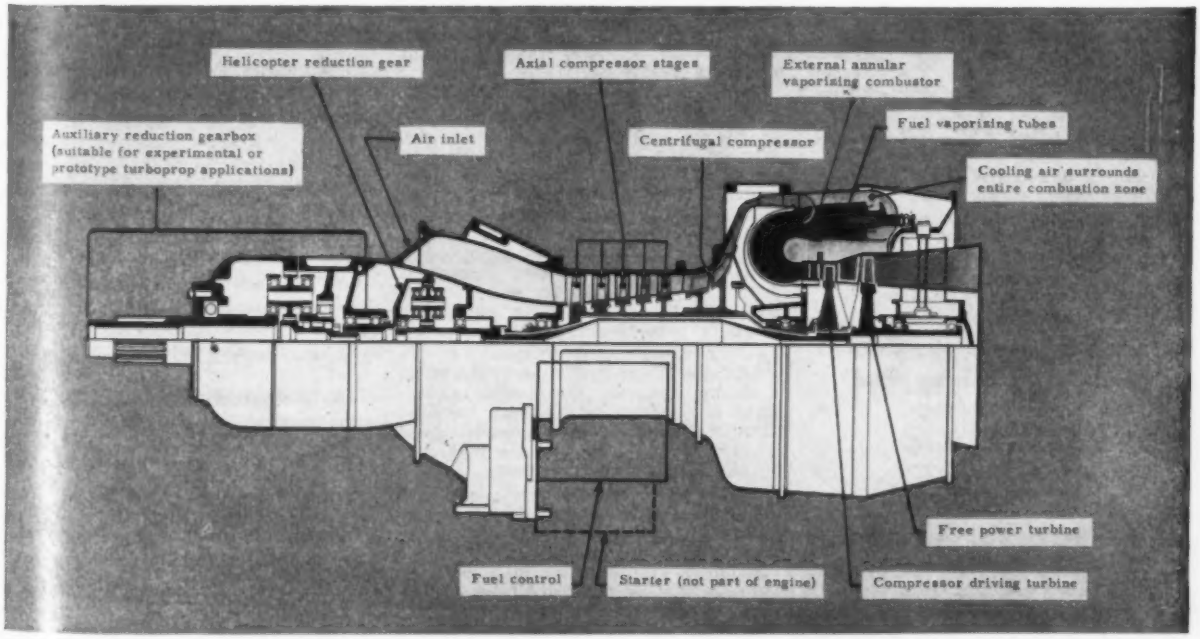
• **Curtiss-Wright** consolidated profit for first half of 1956 was $20.5 million, against $15 million for same period a year ago. About half sales were commercial, compared with 40% for first half 1955. Backlog June 30: $657 million.

Maus Gets Champion Aviation Sales Post

Champion Spark Plug Co. v.p. Duane Stranahan has named Burns M. Maus to a newly created post of aviation sales manager with headquarters in the company's Toledo office.

Maus joined Champion in 1945 and has since specialized in military and airline spark plug sales.

Lycoming Reveals T53 Compressor Design Details



First internal design details of Lycoming's T53 free turbine engine reveal transition of compressor from axial stages, through a mixed-flow stage, to a final centrifugal stage. Engine is slated to power Bell XH-40 Army utility helicopter and recently passed its 50-hour preliminary flight rating test. T53 is now in limited production for helicopter prototype development and will soon start flying testbed trials in a Kaman HOK-1 helicopter.

Letters

Praise from Rome

To the Editor:

I recently had the opportunity of reviewing your article entitled "Experts Take New Look at Air Traffic Control" in the July 2 issue of AMERICAN AVIATION, also the article entitled "Systems Engineering Outmodes 'Black Boxes' Concept" in the April 23 issue.

These articles have excited considerable interest at Rome Air Development Center and are relevant to the System Development Plan which we have been requested to prepare by Headquarters Air Research and Development Command. . . . We would greatly appreciate receiving reprints or other reproduction of these articles.

JOSEPH L. RYERSON
Rome Air Development Center
Griffis AFB
Rome, N. Y.

Mr. Vaughan Likes Us

To the Editor:

I have been subscribing to AMERICAN AVIATION for six months or more. It is the most informative magazine of its kind. My heartiest congratulations!

GUY W. VAUGHAN.
Bethel, Connecticut

[*Editor's Note: High praise from one-time (and World War II) president of the giant Curtiss-Wright Corp.*]

Don't Sell DC-3 Short

To the Editor:

I'd like to congratulate AMERICAN AVIATION on the most excellent and timely memorandum entitled "Let's be Realistic About Local Carriers" which appeared in your July 2nd issue. In this memorandum addressed to you, Mr. Henzey certainly very sharply pointed out how closely the deficiencies of the venerable DC-3 relates to the plight of the local service carriers.

If there were no other answers, it would indeed seem time for the airlines to replace "old dependable." However, Mr. Henzey's remarks also brought to my mind how little attention has been given to one other readily available means of improving the situation. The DC-3 is entirely capable of being its *own* "replacement" in terms of becoming a first class revenue producer through a series of modifications, accomplished progressively as the profits and traffic needs of the carrier require.

The work of my company in developing and certifying the R1830-94 as a source of greater horsepower for the DC-3 has resulted in approvals for substantial increases in allowable gross weight. This is obviously the first step in increasing its earning power.

The next step involves speed and range improvements and, as "straws in the wind," note the recent announcement by AiResearch of their DC-3 Maximizer kit developed in association with Benny Howard, and giving over 20 mph gains in cruise speed at reduced operating cost and low initial cost. Also Aircraft Conversion Corporation of Detroit has just announced completion of "T" Category certification of a DC-3 powered by R1830-94 engines and incorporating their "Challenger" modification package. Their modification program results in substantial performance gains and finally removes the old stigma of the DC-3 that it could not meet current official performance requirements.

These programs are only a beginning toward "stretching" the DC-3 to make it one of the best and cheapest local-service aircraft. I predict that within two years the DC-3 will be "T" categoried for 29,500 lbs. gross weight with capacity for carrying 36 passengers and baggage plus cargo efficiently and speedily over any typical local service route.

That is, of course, for the not too distant future. But there are modifications and powerplants available *now* for beginning to improve local service DC-3 operations and for preparing the DC-3 for its next stages of modification.

F. H. STEWARD
President
STEWARD-DAVIS INC.
Gardena, Calif.

Plaudits

To the Editor:

Your recent editorial "Let's Be Realistic About the Local Carriers" was excellently written. Congratulations on a concise, informed presentation of our problem.

We appreciate your interest in our industry and our problems.

F. E. HOWE
Executive vp and Treasurer
Central Airlines Inc.
Ft. Worth, Tex.

Books

Conflict of Interest. *By Walter F. Pettit. Published by Small Defense Industries Association, 3780 West 6th Street, Los Angeles 5, Calif. Price (to non-members), $2.*

Issued as "Management Report No. 2" by the Small Defense Industries Association, this book by a San Francisco attorney tells how ex-government employes and retired military officers can avoid civil and criminal penalties in their work in private industry. The Association points out that there is much confusion about the relationship such employes may maintain with federal agencies. The report is believed to represent the first effort to analyze all pertinent legislation.

The Selected Works of Wing Theory of Sergei A. Chaplygin. *Translated from the original Russian by Dr. Maurice A. Garbell and made available at printing cost ($5.00) by the Garbell Research Foundation, 1714 Lake St., San Francisco 21, Calif.* This book by the famed Russian aerodynamicist, first published in Moscow in 1949, contains 97 two-column pages and hundreds of mathematical formulas and figures in its unabridged translation.

Production Spotlight

• Wright Air Development Center has awarded Douglas-Long Beach a design study contract to come up with a "unitized" cargo loading and overall cargo handling system for such aircraft as Fairchild C-119 and C-123, Lockheed C-130 and Douglas C-133.

• Russian Tu-104 jet transport recently flew 1,130 mile nonstop Moscow to Copenhagen route in record time of 2 hrs. 15 mins., averaging slightly more than 500 mph. Aircraft bore registration CCCP-5414 (highest yet seen), whereas first Tu-104 that visited London six months ago was numbered CCCP-5400.

• Farnsworth, division of IT&T at Ft. Wayne, Ind., is moving into the missile business as a major test system supplier for Boeing's Bomarc. Previously the company provided test devices for both the Talos and Terrier missiles, but on a small scale. Bomarc development is "push-button" test system that gives a go or no-go answer before missile is fired.

• Boeing has two advanced versions of its model 502 free turbine engine on the drawing boards. Both, however, will be in the lower power ranges as company policy is to stay at 500 shp or below—not getting into the area served by Lycoming's T53 or General Electric's T58.

• Douglas is looking into problems of canopy jettison under water in connection with its carrier-based A4D, F4D and F5D. Company is using a 64,000-gallon water tank at El Segundo for tests.

• Douglas A4D is completing fleet introduction program at Quonset Point, R. I.

• Boeing KC-135 will fly next month about same time the prototype 707 returns to flight duty.

• Air Defense Command is using a fleet of T-33s as a fast airlift to carry many of the critical items necessary to maintain its fighter fleet.

• More than 3,000 modifications have been ordered on the Boeing B-47 during its six years with USAF. Earlier bombers, B-29, B-17, B-24 etc., had considerably more change orders in first two years of their operation.

• Air Force is studying use of such missiles as Matador, Snark and Navaho for reconnaissance purposes. Principally they will be used for damage assessment in conjunction with ICBMs.

• Military Air Transport Service has accumulated 12,000 flight hours in testing P&W T34 turboprop engines on Boeing YC-97J and YC-121Fs at Kelly AFB. Engine overhaul period has been extended to 600 hrs. with four individual T34s authorized to run 750 hrs. MATS officials feel T34 overhaul time will be 1,000 hrs. by the time the Douglas C-133A goes into operational service next year.

• Air Transport Assn.'s Rotorcraft Committee has been disbanded and will soon be replaced by a similar group in ATA made up of representatives of the three major helicopter operators—Los Angeles Airways, New York Airways and Helicopter Air Service, Inc. (Chicago).

• Navy hopes of breaking the world speed record (1132 mph set by British Fairey Delta II) were dashed by Defense Department on security grounds. But Navy will be allowed to race its Chance Vought F8U-1 under restrictions in the Thompson Trophy race this year. Air Force won trophy last year in F-100 at 822 mph.

• Fairchild has just rolled out its 150th C-123 assault transport.

• Army is financing a study of means to enhance the radar reflectivity of light aircraft. Results might have an important bearing on solutions proposed for air collision problems and air traffic control.

LIKELIHOOD OF INCREASED MILITARY APPROPRIATION requests for aircraft and missiles still appear strong for Fiscal 1958. This despite growing possibility of cut in Air Force goal of 137 wings of manned aircraft.

Top Pentagon officials see chance of post-election cut in size of military establishment as good, echoing cautious predictions of AF Secretary Donald Quarles. (See story, p. 25.) Nevertheless, they expect no downward revision in dollar level of procurement for aviation items.

Confides one Defense budget expert: "Counting aircraft and missiles as a package, I see no reductions, and probably some increase, in the procurement level." This will occur despite some reduction in unit procurement volume.

●

THREAT OF MASS EXODUS OF SCIENTISTS from National Advisory Committee for Aeronautics is easing in all directions. Biggest assists stem from session-ending steps by Congress to authorize more top jobs plus new pay scales adopted by Civil Service Commission. New Civil Service retirement bill also contributed.

Most widespread improvement lies in top-of-grade salary set by CSC as minimum for some 1,625 NACA research scientists effective September 22. And, although NACA did not get entire 50 top-paying "PL-313" jobs it asked for, the 20 voted by Congress now give it 30 positions in the $12,500 to $19,000 bracket.

Here's how new grades will pay: GS-9—$6,250; GS-11—$7,465; GS-12—$8,645; GS-13—$10,065; GS-14—$11,395; GS-15—$12,690; GS-16—$13,760; and GS-17—$14,835.

●

LONG-AWAITED RADAR BEACON PROGRAM to ease future ATC situation will not enter technical engineering evaluation phase until about January 1. Air Navigation Development Board project to determine usability for common system will involve some nine stations in Norfolk, New York, Washington and Chicago areas. Next step will be operational evaluation, expected to start by mid-1957.

Stickiest problem still to be solved concerns inter-agency (CAA-military) agreement on operational limitations needed to overcome technical shortcomings. Beacon's capacity is such that number of ground interrogators in system must be limited, and agreement on number of interrogators to be used, where they may be used, etc., remain to be ironed out.

●

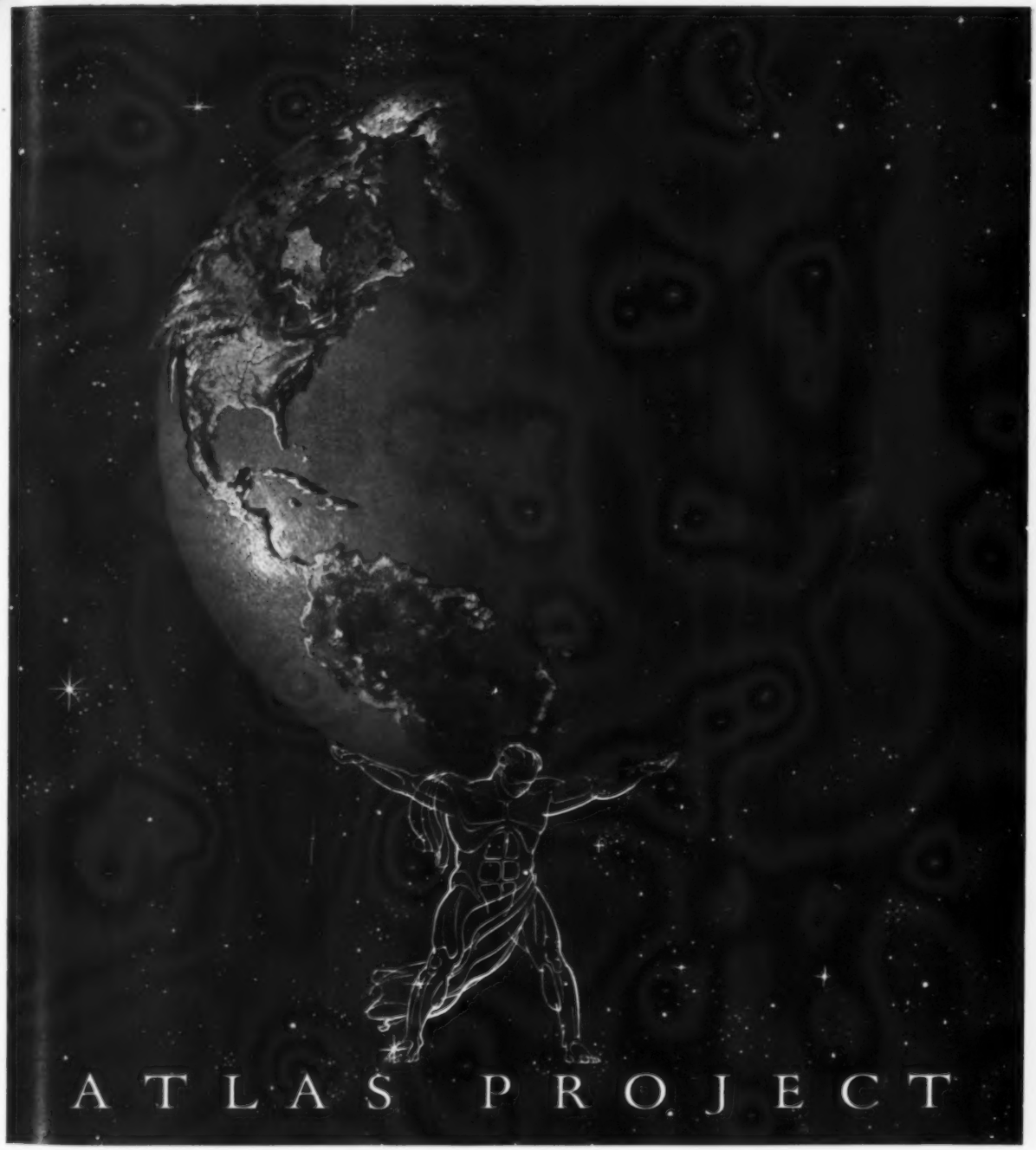
MILITARY MAY BE FACING a new community relations problem of major scope as result of recent west coast fiasco staged by Air Force in futile attempts to shoot down runaway Navy drone. Although incident was localized in Southern California, its impact could spread to other areas.

Immediate repercussions: California residents are suggesting ban on rocket-firing planes and remote-controlled drones over populated areas. Suits against government to recover fire and other damages are in the wind.

●

AIR FORCE IS TRYING to "turn back the clock" to earlier and simpler days of aircraft procurement in attempt to secure flying prototypes of two new jet utility planes at no cost to government (see story, p. 14)

And chances of success are considered good in industry circles. One possible exception: some officials express amazement at the low price figures quoted by AF.



Convair's Atlas... a key to ultimate peace!

A TOP PRIORITY PROJECT OF THE U.S. AIR FORCE

Convair's intercontinental ballistic missile, a vital weapon for our national security, is aptly named Atlas. As a deterrent to war—a force for world peace—it literally can sustain the future freedom of all mankind!

For ten years Convair's **Engineering to the Nth Power** has led the way in the development of the ICBM. Today, Convair continues its leadership with the largest and most experienced organization in the astronautics field. **CONVAIR-*Astronautics*** is now building a complete facility in San Diego, California, to produce the Atlas... a key to ultimate peace!

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

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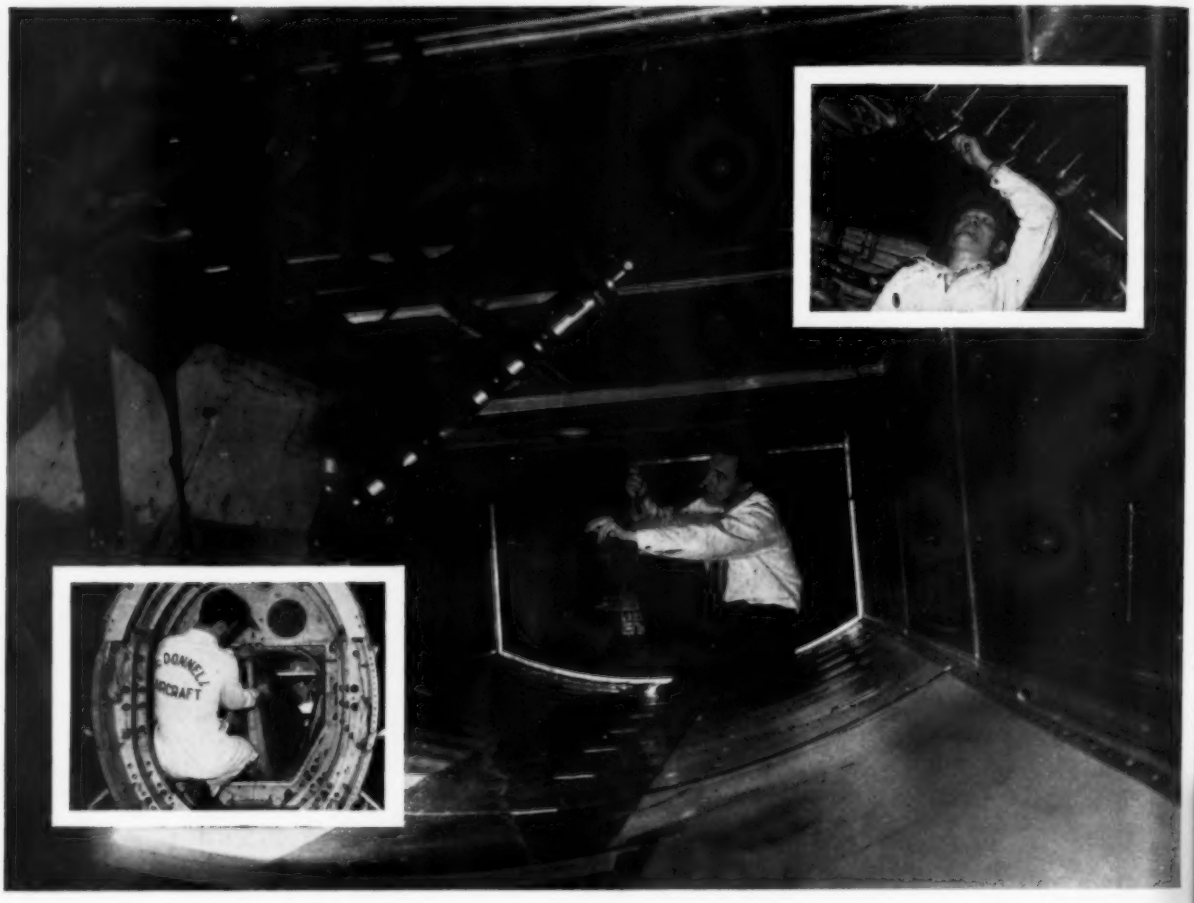

Unique zipper panels are light yet strong, airtight yet quickly opened

PRESSURIZED COMPARTMENTS pose tough sealing problems—especially in areas where speedy access is required. But B. F. Goodrich engineers have a practical answer.

They select the proper fabric for the desired strength, coat it with the particular rubber compound that gives flexibility, durability and minimum weight; add B. F. Goodrich Pressure Sealing Zippers. Result: pressure-tight panels that zip open in seconds! Here's how these unique panels are being used:

On Lockheed's Super Connies (big photo) baggage compartments are lined and sealed with B. F. Goodrich panels that resist oil, flame, aging. Tough, rubber-impregnated glass fabric withstands the impact and scuffing of baggage. Access doors zip open for servicing equipment in 33 places.

B. F. Goodrich panels form the subfloor under the crew compartment in the Douglas C-124B (top). They're reinforced with steel cables to withstand a maximum load of 100,000 lbs. The Zipper opens easily for quick access to equipment, provides an airtight seal.

Used as a fume curtain seal between cockpit and fuselage in McDonnell's F2H (bottom), the B. F. Goodrich panel eliminates a metal partition. Now mechanics get in and out with a zip, don't have to fuss with nuts and bolts.

B. F. Goodrich panel materials combined with Pressure Sealing Zippers (made only by B. F. Goodrich) can be used for engine covers, inspection ports and aileron gap seals. There are many other aircraft uses; there's bound to be one for you. Write: *B. F. Goodrich Aviation Products, a division of The B. F. Goodrich Company, Akron, Ohio.*

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VOL. 20 No. 7

Are Cuts in Armed Forces Inevitable?

High Defense Department official forecasts 'downward readjustment' in military establishment for 1958-63.

By HENRY T. SIMMONS

A broad downward adjustment in the size of U.S. military forces now appears inevitable for Fiscal 1958. It will set a pattern for the national military establishment for the 1958-63 period comparable to the "New Look" re-appraisal of 1953 which has shaped the present military force.

A Defense Department official high in the councils of Defense Secretary Charles Wilson put it this way in an interview with AMERICAN AVIATION: "It is simply a fact that in 1956 and 1957 we are approaching another turning point. There is no question that we will shift course. Nobody in the building (the Pentagon) can tell you how sharp the turn will be, but we will turn."

• **His remarks followed** cautious predictions by Air Force Secretary Donald Quarles in New Orleans early this month that Fiscal 1958 might see a downward adjustment in the Air Force goal for 137 wings of manned aircraft, particularly in the tactical area where the Army is rapidly developing missile artillery adequate to meet its needs for close ground support.

"The fact that Quarles touched on the Army's increasing capabilities in this area is, I think, right," the Defense official said. "The Army will need less support from the Air Force, and there is a limit to how many types of weapons you need or can have to take care of your targets."

But he added: "There are a hundred different facets to the problem which will have the effect of changing force elements. No person or group knows today with any degree of preciseness what will be done for 1958-63 as yet. But I wouldn't predict anything that would actually justify a headline, 'drastic slash'."

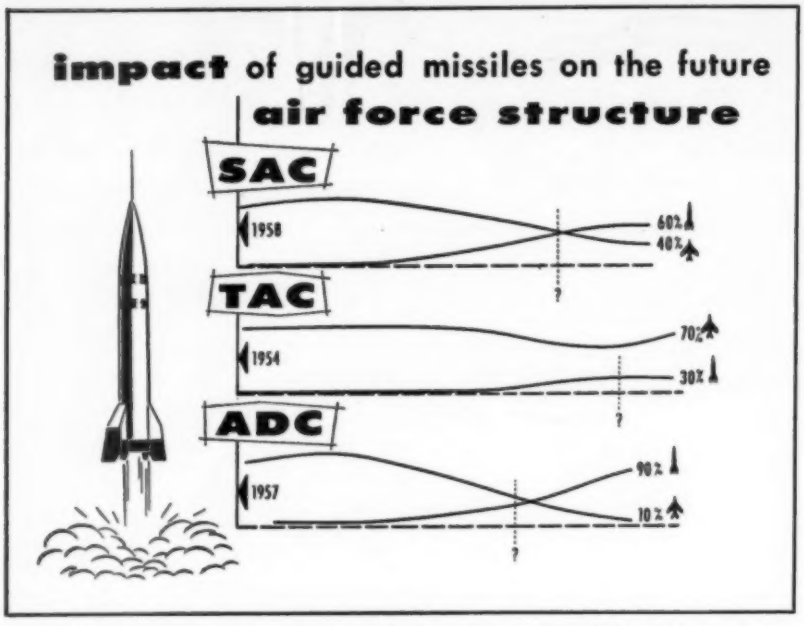
The Major Principles

Two major principles are guiding the second Administration New Look:

• **Military capability** should be as-

McDonnell Voodoo Adds to Its Prowess

McDonnell Aircraft's F-101A, already one of the fastest (it has flown more than 1,000 mph) and most potent interceptors in the USAF inventory, is undergoing numerous tests, including carrying special weapons and additional external fuel tanks for longer range.



This is the Air Force's long-range picture of the movement of guided missiles into operational status in its three major combat commands. Chart covers a 10- to 20-year period, beginning with the introduction of operational missiles in each command. Greatest application is anticipated for Air Defense Command, least for Tactical Air Command.

sessed in terms of the quality of individual weapons possessed by all the services collectively rather than in terms of the quantity of weapons the services individually can bring to bear.

• **Increasing reliance** on the use of nuclear weapons of various sizes to deal with all but the most localized of military skirmishes involving no East-West conflict.

The official predicted that there will be an effort to "break the numbers racket" in military planning. By this, he said, he referred to such claims as the one that 137 wings are essential to national security. He noted that the USAF wing structure contemplated today is much more powerful than when it was originally conceived, pointing out that a heavy bomber wing now consists of 45 B-52s instead of 30 as originally planned.

The forthcoming adjustment will not be limited to the USAF, he said. All services will be affected across-the-board. The Navy's 17 Carrier Air Groups may face a cut to reflect the introduction of vastly more powerful Forrestal-class carriers in place of the smaller Essex-class vessels, while the Army's divisional strength is likely to be reduced further, with more emphasis placed on combat readiness of remaining units.

"The Forrestal and the Essex-class carriers take the same space on an adding machine tabulation, but there is quite a difference in the number and size of aircraft they can carry and in their over-all capability," he said. "The Forrestal, for example, can carry nine times as much aviation fuel as an unconverted Essex."

"The Army has a place in the picture as well as the Marine Corps," he continued, "but I think the type and character of the Army will change from how big it can build to being ready today. I envisage that the Army's strategic reserve will be moderate-sized and ready, rather than large and with half its strength devoted to the idea of rapid expansion."

• **The other prominent theme** guiding the re-evaluation of military forces is the premise that the nation will use whatever weapons are necessary, including nuclear weapons, in event it is involved in another war of appreciable size, the Defense official said.

"It just isn't in the cards that you would fight another war the size of Korea without atomic weapons," he declared. "But if it is inconceivable that you would engage in an eight-division war without nuclear weapons, you still might not want to use them in a two-division war. While it's not clear where we will draw the line, it is obvious we are willing to use at least tactical weapons in smaller wars and that must be taken into account in determining the size of the conventional forces we need."

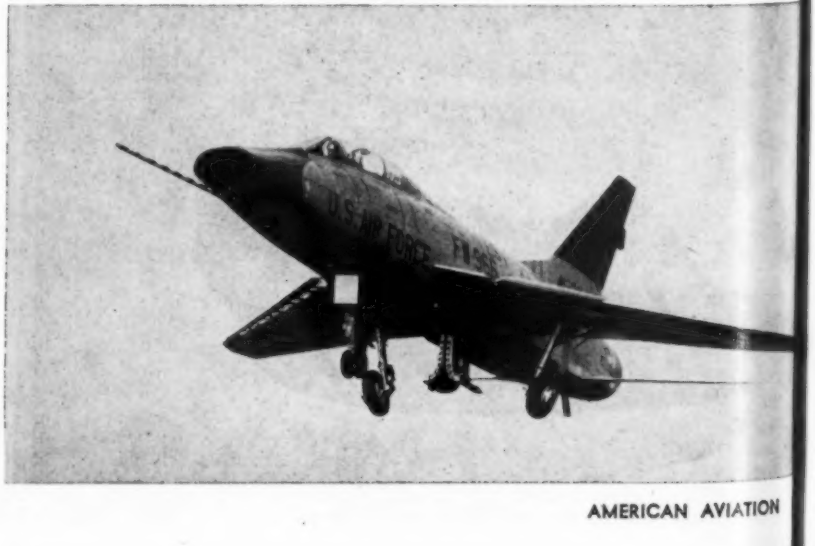
• **Impact of cuts** in USAF wing strength and Navy air groups will not take the form of contract cancellations, the Defense official said. "I don't see anything coming which would involve any cancellations—mainly because we haven't ordered all the equipment we would need to meet present goals."

A company like Republic Aviation Corp. which is tooling up to produce the F-105 supersonic fighter-bomber for the Tactical Air Command need not fear any reduction in its present orders, he said. But he acknowledged that the volume of unit procurement slated for Republic under present goals would not be achieved if reductions are ordered in TAC strength, and that this would apply to other companies supplying close-support equipment to the USAF.

In this connection, he noted that procurement of the Century series of fighters (mainly the North American F-100) has been insufficient to maintain TAC's present force. ◆◆◆

Two-Place Super Sabre Makes First Flight

Newest Super Sabre in the Air Force inventory is this two-place F-100F, shown as it made its first flight at Los Angeles. North American Aviation says F-100F is supersonic in climbing flight. This version can be flown solo as a fighter-bomber or air superiority fighter or can carry an observer or student in rear cockpit.



How CAA's New Offices Shape Up

AIR TRAFFIC CONTROL

Director—D. D. Thomas
Deputy—H. S. Chandler

Planning Division
Chief—Bert Moore
Deputy—Jack Hilton

Current Requirements Branch
Robert Gayle

Future Requirements Branch
Lisle Ditzler

ATC Operations Div.
Chief—R. Sturtevant
Deputy—G. Pearson

Facilities Opns. Branch
J. Watson

Opns. Inspection Branch
D. Long

Opns. Management Branch
R. Taylor

Airspace Use Branch
E. M. Mehrling

Procedures Div.
Chief—Unnamed
Deputy—W. Hendershot

Int'l Standards Branch
E. Shores

Communications Branch
E. Shivers

Military Liaison Branch
Fred Smith

ATC Procedures Branch
J. Gross

AIR NAVIGATION FACILITIES

Director—J. H. Tippets
Deputy—P. Caporale

Systems Engineering Div.
Chief—D. S. King

Program Engineering Div.
Chief—W. Burko

Maintenance Operations Div.
Chief—W. Boesch, Jr.

Radar Engineering Branch
J. S. Turner

NavAid Engineering Branch
H. I. Metz

Communications Engineering Branch
G. E. Goudie

Plant Engineering Branch
R. J. Alpher

Flight Inspection Branch
A. E. Jenks

Lowen's New Table of Organization For CAA Cuts 'Chains of Command'

A major structural realignment of CAA will shortly be announced by Administrator Charles J. Lowen. Details are now being finalized and implementation is imminent.

Lowen has been shaping up his plan for some months. He has been working from a basic philosophy that if CAA is to fulfill its statutory responsibilities for operating the airways and administering safety, its organizational structure must be stripped of its cumbersome "chains" of command.

Partial blame for CAA's failures in keeping up with the times has been placed on the agency's physical makeup. Commerce Under Secretary Rothschild wryly declared that CAA has had "trouble keeping up with yesterday" without having the "ability to look ahead."

Now with a record near-$235 million to pay for its programs in fiscal 1957 and an even larger budget in preparation for the following year, Lowen wants a modern, streamlined agency to administer it.

Lowen's plan calls for each of his department heads to be completely and directly responsible for his area of assignment. The previous Administrator divided the responsibility among Office directors, assistant administrators and a separate all-powerful planning section.

Lowen already had implemented the first major portion of the reorganization when on July 1 he created a separate Office of Air Traffic Control under David Thomas and a new Office of Air Navigation Facilities under Joseph Tippets. Operating under what Tippets calls a "togetherness" policy, Thomas and his aids will prescribe operating requirements and ANF will design and install the facilities needed to meet them.

The two staffs (see above for lineup) are already in high gear and well on their way to implementing the first phase of the telescoped airway plan for which Congress appropriated $75 million.

The balance of the reorganization is being built around this pivotal area. Program planning will become the responsibility of each of the offices, rather than being vested in the hierarchy of "ivory tower" program coordinators. Here's how the overall plan will take shape:

• The Office of Program Planning, Research and Development will be abolished. Program planning officers will be reassigned directly into the Offices of Air Traffic Control, Navigation Facilities, Safety and Airports.

• Two of the three posts of Assistant Administrators will be eliminated: Operations and Program Coordination. By this action, the office directors assume full powers for their offices, reporting directly to the Administrator rather than through the "chains of command." In this way, the Administrator has a clear line of communication with each major function of his agency rather than having it "remoted" through cummersome executive layers.

• A high-level position of research and development coordinator is being created to be directly responsible to the Administrator. His functions will be to serve as CAA liaison and coordinator of all interrelated activities with the military, ANDB, ACC, the office of Edward P. Curtis, and other high level intergovernmental activities directly and indirectly effecting CAA's statutory authority.

• A small research branch will be created for continuing CAA's forecast activities.

Lowen has deferred action at this time for creating a separate Office of Aircraft Engineering which presently functions under the Office of Aviation Safety. The Safety Office (which may undergo a name change) is not directly affected by the reorganization. However, its director, Bill Davis, has been inaugurating some changes in its philosophy of operation. Armed with Lowen's charge that CAA has been "delegating away its authority," Davis is beginning a retrenchment of the designee system.

About 75% of the CAA-designated inspectors and engineers will be replaced by CAA-employed personnel over the next three years. The designee concept has not worked. Davis has found that it has cost as much if not more to supervise the designees than if CAA had retained the functions itself. CAA will begin hiring about 110 agents and engineers to replace the designees. However, certain of the designees will be left in "strategic spots."

Also on Lowen's agenda is a project to strengthen the Indianapolis Technical Development Center. Plans, Lowen told Congress, for broadening the Center's scope were being readied, though no further word is now available. TDC, which has operated under the Program Planning Coordinator, probably will be placed directly under the Administrator or the new Development Coordinator when he is named.

In Lowen's own executive wing, he will work with his Deputy, James T. Pyle. The position of Assistant Administrator for Administration will be retained to handle the many business, fiscal and housekeeping duties of the Agency. The post of Executive Assistant will be eliminated. ◈◈◈

Curtiss-Wright Finds Profit in Diversification

President Roy T. Hurley's drive to diversify his already sprawling Curtiss-Wright Corp. bore fruit in two new fields this month: missiles and trucks.

Utica-Bend Corp., a newly-formed subsidiary of Curtiss-Wright, was awarded a $36,077,000 Army contract to manufacture two-and-a-half-ton trucks. This was followed shortly by a second Army contract of $16,565,000 for production of the wire-guided Dart anti-tank missile.

The new business for Curtiss-Wright stems directly from its program to aid the financially-distressed Studebaker-Packard Corp. The auto company was originally slated to get the contracts, but they were withheld by the Pentagon when Studebaker-Packard appeared in imminent danger of collapse. A condition of their award was that Curtiss-Wright take over all the defense work of the auto company.

The role of corporate Good Samaritan was an expensive one for Curtiss-Wright. Total cost of its assistance to Studebaker-Packard: $35 million in cash, underwriting a $15 million extension in bank credit for the auto company, and an option to pay another $25 million for five million shares of Studebaker-Packard stock during the next two years. Main elements of the transaction:

- **Twelve-year lease** of Studebaker-Packard plants at Utica, Mich., and South Bend, Ind., plus payment for all work in process, at a cost of $25 million cash.
- **Outright purchase** of Aerophysics Development Corp., Santa Barbara, Calif., for $10 million cash. (This was the wholly-owned Studebaker-Packard subsidiary which developed the Dart missile.)
- **Arrangements to provide** the auto company with an additional $15 million in cash, presumably by underwriting an extension of its bank credit.
- **A three-year contract** to provide management advice to Studebaker-Packard, which will continue to operate as a separate entity with its own directors and officers.
- **An agreement** with Daimler-Benz A.G. of West Germany which will provide Studebaker-Packard with rights to important German developments in the diesel and gasoline engine fields.
- **An option to buy** five million shares of Studebaker-Packard stock during the next two years at $5 a share, contingent on the agreement of the auto company's stockholders to approve the option and reduce par value of the stock from $10 to $1 a share.

Hurley predicts Curtiss-Wright will be able to put $200 million in defense business annually into the two leased plants of Utica-Bend, although he has not specified the work. Besides the Dart missile, to be built at the Utica plant, and the trucks, which will be built at South Bend, the new Curtiss-Wright subsidiary will also overhaul J47 engines and manufacture J57 components under subcontract to Ford. In fact, Defense Department officials believe the latter activity will constitute the major work of the two plants. Hurley, however, has indicated that the leased plants can expect a substantial amount of subcontract work directly from Curtiss-Wright itself.

Pentagon officials take pride in their part of the transaction between the two companies, noting that not one dime of the taxpayers' money was used to bail out Studebaker-Packard and that the Utica-Bend subsidiary of Curtiss-Wright will receive only those contracts the two plants normally could have expected had they remained part of a healthy Studebaker-Packard.

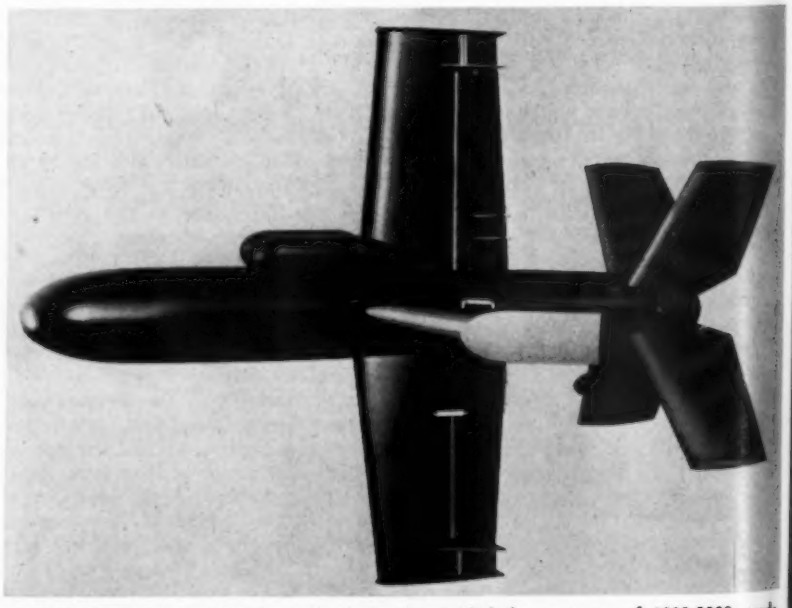
"The key to the business actually was to plan on putting the defense business all in a subsidiary so that our business would be taken care of. That was our primary purpose in the whole business," explained Defense Secretary Charles Wilson in a press conference earlier this month. "If as a little dividend on the side it made it possible to avoid a collapse of the Studebaker-Packard Company, affecting their employes and 130,000 stockholders . . . that was a dividend on the side as far as we were concerned."

- **Just how Curtiss-Wright** will fare with its new automotive and missile activities, only the future can answer. Nobody in the Pentagon seriously believes Hurley has fallen heir to a "gilt-edge bonanza," as one official put it, pointing out that Curtiss-Wright has committed itself to a long-term investment with no guarantee of any government business beyond that which it can obtain through its own management and production ability.

But Curtiss-Wright has prospered handsomely under Hurley's diversification policies since he took over its direction and there is no reason to believe it will not continue this course, barring a general business recession and a substantial reduction in military procurement. ◈◈◈

A-Plane Near

First atomic-powered flying vehicle will be ready in about two and a half years, Assistant Secretary of Navy for air Garrison Norton predicts. Production aircraft will be considerably later.



ARMY'S NEW DART anti-tank missile. It is wire guided, has a range of 1000-2000 yards. Based on a development by SNCA du Nord of France, the weapon was developed in the U.S. by Aerophysics Development Corp., formerly a subsidiary of Studebaker-Packard. Streamlined protuberances contain the wire. The solid-propellant rocket missile will be produced by Curtiss-Wright's new subsidiary, Utica-Bend Corp., under a $16,565,000 Army contract.

Whittaker Ratio-Flo Fuel pump —hydraulically operated for maximum performance at high altitudes!

The Whittaker Ratio-Flo fuel pump offers the lightest, most efficient method of obtaining variable speed control through the use of a fixed volume hydraulic motor.

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In a line mounted unit of operation, the Whittaker pump provides:

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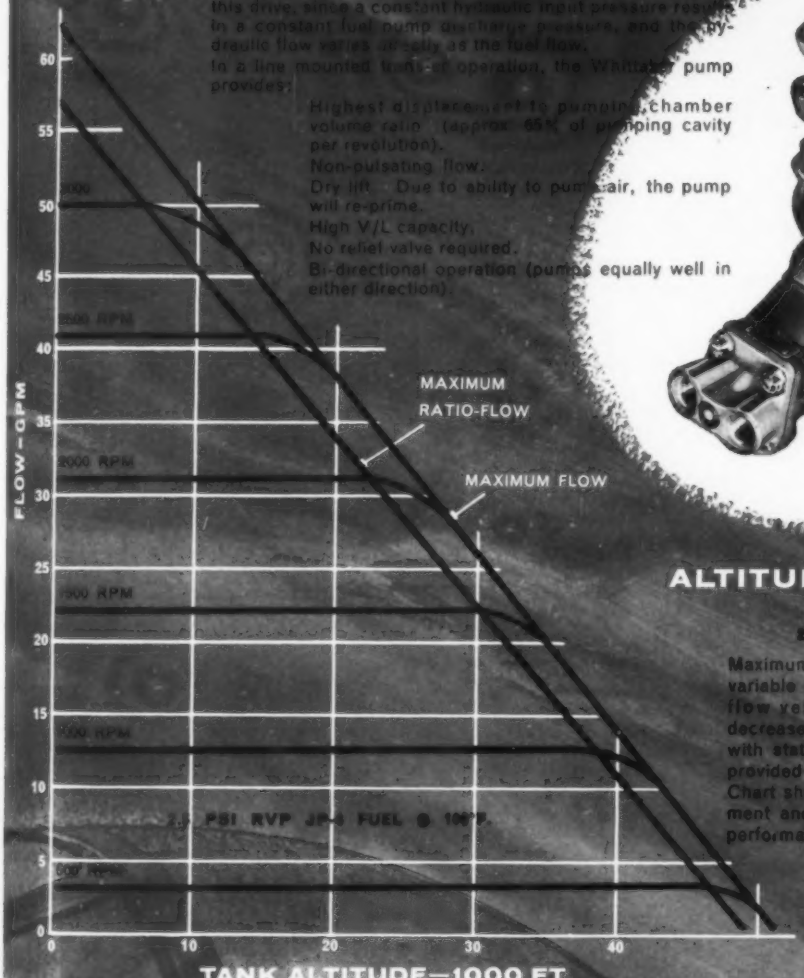

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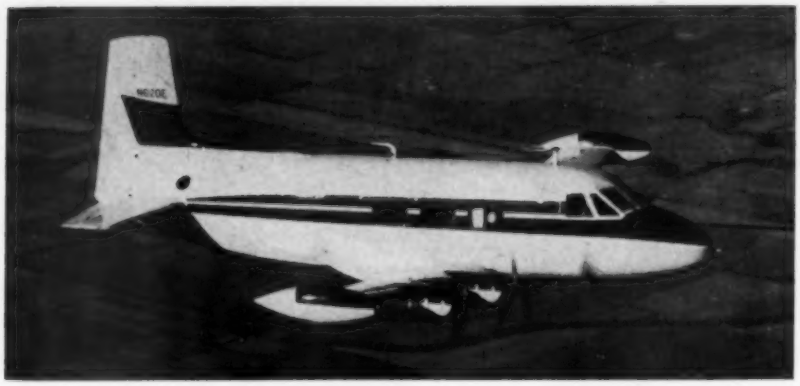


Cessna 620 Makes Maiden Flight

First flight of the Cessna Model 620 four-engine executive transport was successfully accomplished, following 10 days of taxi tests earlier in the month (AMERICAN AVIATION, August 13). The prototype was in the air for one hour and five minutes and was flown at an altitude of 12,000 feet.

The flight was "beyond expectations," a company spokesman reported, with "everything going smoothly." While it is too early to arrive at specific performance data, he said the initial flight indicated the 620 will more than meet previously released estimates. Flight tests are scheduled to continue throughout the year.

Next formal announcement of the plane's progress will be made September 20, when Cessna officials will reveal production and sales plans at a two-day open house in Wichita.

CAA Evaluates Decca, AIL Taxi Radar

Contestants in the CAA search for satisfactory airport surface detection radar equipment at this time are units made in the U.S. and Great Britain.

Equipment made by Decca, Ltd. and being installed at the Seattle-Tacoma, Wash. airport will be evaluated in comparison with ASDE made by Airborne Instruments Laboratories in the U.S. AIL equipment is being installed at the Idlewild, New York airport.

The British equipment is reported to cost less and be more compactly packaged than similar U.S. equipment. It is said to operate in the "Q" band near 34,000 megacycles and to permit resolution of such objects as runway lights and roadways as narrow as 10 feet, as well as the location where jet aircraft landing parachutes are released on the runway.

CAA's evaluation is said to be concerned with satisfactory operation of the Decca unit's utility as a taxi radar and with the effect of British design simplification on maintenance problems.

DOD Directive Orders Electronics Reliability

Defense Department believes "a significant cause" for poor reliability of electronic equipment has been "the initiation of quantity production before product design is matured."

A directive ordering a new procedure to be followed by military departments in approving new electronic systems and equipment for service use was issued last month. It requires that pilot production of newly developed equipment and systems be carried out before quantity production is begun.

Details of how the procedure will be applied are not yet established, but according to the DOD announcement size of the pilot run must be "enough models to permit a statistically sound determination of system reliability."

Announcement of the new attack on the problem came from J. M. Bridges, Director of Electronics, Office of the Assistant Secretary of Defense for Applications Engineering. He said the time gained through prematurely procured items has been more than offset by later delays in production and in-service problems, and costly design changes.

Contracts

Commerce Dept. has announced the following contracts. Unless otherwise specified, contracts are with USAF:

Minneapolis-Honeywell Regulator Co., Minneapolis, four contracts totaling $7,863,744 for automatic pilot systems, MA-3 lab systems and facilities for WS-107A and WS-315A programs (intercontinental and intermediate range ballistic missiles).

Douglas Aircraft Co., Tulsa, Okla., $6,745,000, facilities in support of C-132.

Texas Instruments Inc., Dallas, $642,230 and $783,511, radar sets and components.

Admiral Corp., Chicago, $345,949 and $2,347,447, receiver-transmitters and parts.

Collins Radio Co., Cedar Rapids, Ia., $2,034,990 and $1,547,428, radio receiver-transmitters and components.

Reeves Instrument Corp., New York City, $304,488, simulation problems, and $3,128,419, bombing data computer.

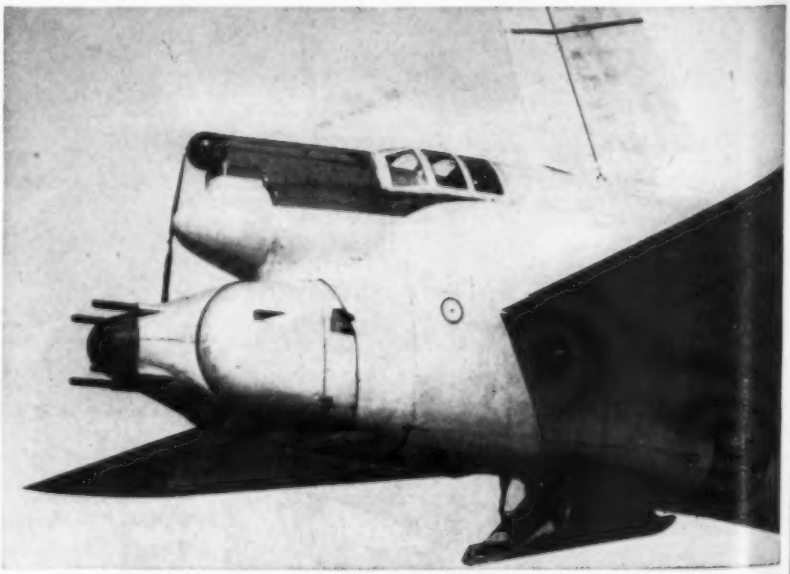
Convair-Ft. Worth, $308,000, additional facilities for B-58 program, and $2,441,000, flight tests for F-102A.

Boeing Airplane Co., $935,000 and $963,000, facilities for production and flight testing of B-52, and $535,000, installation of bombing navigation radar systems in B-52.

Lofstrand Co., Rockville, Md., $1,210,523, emergency personnel rocket propellant neutralizer.

Continental Aviation & Engineering Corp., Detroit, $787,600 and $255,704, J69 engines.

B-52 Defensive System — A Robot Killer



Close-up view of B-52 tail shows radar-controlled defensive system which tracks, leads and destroys attacking fighters. Radar picks up enemy aircraft, feeds data into electronic brain which computes speed and distance data, then signals gunner to fire. System was developed for Air Force by American Bosch Arma Corp., Garden City, N. Y.

Here comes America's first jet transport-tanker

Rolling majestically off one of the production lines at Boeing's Transport Division plant is the nation's first jet transport-tanker, the KC-135.

This revolutionary new type of aircraft gives the Air Force a tanker that matches the performance of today's jet-age bombers and fighters, enabling them to refuel at the speeds and altitudes at which they operate most efficiently. The KC-135 is also the first transport geared to the defense demands of the jet age.

As the first KC-135 rolled out into the sun, the 888th KC-97—last of Boeing's piston-driven airplanes—came off another line in the same plant. Thus, during its 40th anniversary year, Boeing leaves behind the age of piston-powered aviation. The company, a pioneer in jet-flight development, is now devoting its facilities to building jet aircraft exclusively. In addition to the KC-135, its jet production includes the 707 commercial transport, the eight-jet B-52 and the six-jet B-47 bombers.

Although the first of its kind, the KC-135 is a proven aircraft, backed by over two years of intensive flight testing of a prototype model. It incorporates refinements that could grow only out of actual flight testing. In addition, Boeing's unique experience with a prototype model helped cut production time on the first KC-135 by 20%.

The first jet transport-tanker comes logically from Boeing. For this company has designed and built more large, multi-jet aircraft than any other organization in the world, and pioneered and developed aerial refueling. The new KC-135 takes its place in the line of illustrious Boeing aircraft which have, over the past four decades, helped America initiate new eras in both commercial and military aviation.

BOEING

How Ryan Built Healthy $65-Million Backlog

House that T. Claude Ryan built rests on firm foundation, with even division of military and commercial business, and diversity of products.

SAN DIEGO—One of the smaller prime airframe companies now finds itself in a position which many of the industry's giants might well envy—a backlog almost evenly divided between military and commercial work.

The company is Ryan Aeronautical Corp., one of the few major companies in the aircraft industry still headed by its founder and president, T. Claude Ryan.

Ryan's backlog now stands at about $65 million. About 50% represents straight research and development activity directly for the armed forces and military work obtained from other manufacturers under subcontract. But about $32.5 million of Ryan's future production is tied in with two jet transports, the Boeing 707 and the Douglas DC-8.

• **DC-8 work** involves output of the engine power packs—a field heretofore virtually monopolized by Rohr Aircraft of nearby Chula Vista—and now stands at $20 million. As of now the subcontract from Douglas involves power packs for the Pratt & Whitney J57 and J75.

But if Trans Canada Air Lines' order for DC-8s with British Rolls-Royce Conway turbofans becomes a trend, Ryan is hopeful that it will handle that production as well. Future DC-8 orders will probably mean more J57 and J75 pods.

$12.5 Million in Components

• **707 component output** by Ryan involves the aft and mid-fuselage sections of the jet transport and the contract is presently worth only $12.5 million. (A similar Boeing subcontract calls for $12.5 million worth of aft fuselages for the military version of the same aircraft, the KC-135 Stratotanker.) Here, too, Ryan is convinced that as orders come in for the 707 from other air carriers which have not yet decided, its Boeing subcontracts will grow.

Actually Ryan is probably doing some other commercial work, but it cannot be stated certainly. The firm is producing hot parts for various military turbojet engines, including the P&W J57 and J75, the General Electric J47 and J79, the Wright J65 and a new classified Allison powerplant reported to be in the 25,000-pound-thrust class.

Although about 90% of Ryan's J57 and J75 work is for the Ford Aircraft Engine Division in Chicago, the remainder is for P&W proper and these

T. Claude Ryan

parts may end up in the commercial versions of the engines which P&W is supplying for the DC-8 and 707. The same applies to the J79, which is to be utilized in the Convair Skylark jet transport recently ordered by TWA and Delta Air Lines.

Navigation System Promising

• **Also believed** by Ryan officials to have good commercial possibilities is the company's AN/APN-67 long-range automatic navigation system now in production for the Navy Bureau of Aeronautics. AN/APN-67, which incorporates continuous wave radar and inertial guidance principles, uses no ground facilities of any sort.

Described as having "the weight and size of one man," AN/APN-67, which goes beyond shorter range DME and TACAN, provides continuous data on latitudinal and longitudinal position, ground miles covered, ground speed, course drift angle, course error and ground track.

Ryan officials are convinced it will prove highly useful on transocean commercial flights because the pilot, by watching a single instrument, will be able to fly to any point in the world.

The wind is not a factor, Ryan officials point out. The single instrument obtains its own data, integrates it and feeds it to visual indicators, enabling a commercial or military pilot to navigate completely automatically.

But while Ryan prepares for production of DC-8 and 707 components and hopes for commercial uses of its automatic navigation device, the other half of the company's backlog is not being ignored.

• **Officials candidly admit** they would like to see a military airplane flying with the Ryan name. "Certainly we'd like a mass production contract for an airplane or a missile. But not at the expense of our research and development activities."

Strong in R&D Field

It is in the R&D field that Ryan is strong. Its work force amounts to about 4,900 people at present but about 800 of these are engineering personnel working in the airframe, propulsion and electronic fields. Many of the subcontracts Ryan holds from some of the bigger manufacturers of engines and airframes call for extensive research on its part.

Included are such items as the thrust chamber for the Marquardt ramjets for the Boeing Bomarc interceptor missile, the rocket engines for the Firestone Corporal missile for the Army, ramjets for the Hiller HOE-1 tip-powered helicopter and special materials for the afterburners and components of large turbojet engines of virtually every powerplant producer.

On its prime R&D contracts, which involve 25% of its total work, Ryan is evolving such things as electronic missile guidance systems, a helicopter hovering system for anti-submarine work, and its activities in continuous wave radar. Ryan considers itself the leader in the continuous wave radar field.

Three Ryan activities, two involving research and the third being a production item, provide the greatest potential for a missile or aircraft with Ryan's name on it.

• The Firebee, a target drone, is being purchased by all three military services. Using either a Fairchild J44 or a Continental J69 1,000-pound-thrust turbojet, the Firebee simulates the speed, altitude and maneuvers of a modern high-speed aircraft. Known to the Army as the XM-21, to the Navy as the KDA-1 and to the AF as the Q-2, the Firebee, Ryan believes, can be made into a true missile.

• The Vertiplane, an Army-sponsored vertical-take-off aircraft which uses the deflected slipstream principle (AMERICAN AVIATION, June 18, p. 37).

• The X-13 Vertijet, a delta-wing VTO for the USAF now undergoing flight tests at Edwards AFB, Calif.

Jet-powered (one British Rolls-Royce Avon), the X-13 tail-sitter may

Stripped for action in .015 seconds...

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- Arming mechanisms of many types
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- Weapons systems
- Artillery missiles and plastic components

Mach 1 or better, the F-100 lets wing tanks "go" in a split second. As aircraft speeds increase, Winchester-Western's complete mastery of internal and external ballistics becomes increasingly important to air frame manufacturers. The same special instrumentation and knowledge that solved the F-100's wing tank ejection problems with a minimum of time and effort may literally save you months in answering a wide variety of problems dealing with thrusters, stores ejection or canopy removal.

Winchester-Western's complete facilities and long experience with many varied types of armaments, cartridges, ignition systems and packaged power is constantly at the service of interested manufacturers and the Armed Forces.

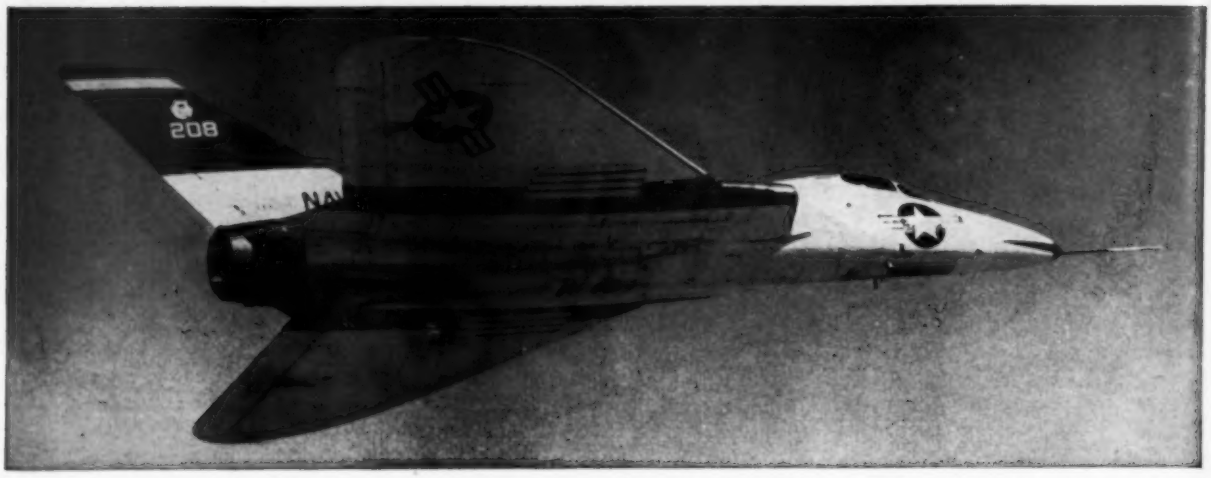
Research and Production facilities at Cleveland, Ohio, East Alton, Illinois and New Haven, Conn.

Employment inquiries are invited from qualified engineers and scientists.

WINCHESTER-WESTERN DIVISION • OLIN MATHIESON CHEMICAL CORPORATION • NEW HAVEN 4, CONNECTICUT

Circle No. 13 on Reader Service Card.

Navy Takes Wraps Off Douglas XF5D



New Douglas XF5D resembles F4D-1 Skyray in appearance, but has a thinner wing, finer and longer fuselage, larger fuel capacity. Both are modified deltas. XF5D, called Skylancer, first flew April 21, with second prototype making initial flight two months later. It has more powerful version of Pratt & Whitney J57 than F4D-1. Douglas says extensive use of integrally stiffened wing skins permits wings to double as self-contained fuel tanks. Fuselage also has fuel cell.

be the forerunner of Ryan's re-entry into the military aircraft production business. Ryan, which built the first Navy gas-turbine-powered aircraft, the FR-1 Fireball and the XF2R, has not produced a military aircraft since it took over the North American Navion in 1947 and made it the L-17B liaison plane for the USAF.

If a production contract should ultimately result from the X-13, the Avon engine would certainly be replaced by a U.S.-built jet engine.

(Ryan itself got out of the Navion business in 1955, selling all rights to the plane to Tubular Service and Engineering Corp. of Houston, Tex. Previously, Ryan reports, Navion spares business had been running about $1 million annually.)

T. Claude Ryan's firm, established in 1927, has other bread-and-butter items, including Ryan-designed fuel tanks with a capacity of 1,700 gallons for the B-47 bomber and 1,000-gallon tanks for the KC-97 tanker.

• **Nor do the above** represent all of the company's miscellaneous projects. The experimental laboratory now has 77 projects under way, shaking down various items and components for production. Included are such activities as honeycomb sandwich materials and pneumatic ducting. However, company officials report, no studies are under way on reverse thrust or noise suppression devices for turbojet engines.

Ryan is therefore presently a company competing for business in many fields of aviation endeavor. Based on its past record, other firms will be feeling the effect of that competition for many years to come. ◆◆◆

L. A. Weather Service Makes Hit With Pilots

Continuous automatic aviation weather broadcast recently instituted in Los Angeles is receiving favorable comments from pilots, but the workload required for the operation is turning out to be somewhat greater than anticipated.

Operated jointly by the U.S. Weather Bureau and the CAA, the new broadcast over the Los Angeles CAA low frequency radio range (332 KCS) transmits flying weather forecasts for the Los Angeles area and for routes to San Francisco, San Diego, Las Vegas and Phoenix. It also provides current weather reports from selected stations, pilot reports and winds aloft forecasts. In addition, it includes notices to airmen, warnings to small aircraft and other advisories for the safety of pilots.

The broadcast is now being operated 16 hours daily from 9 a.m. to 1 a.m. and later is to become a 24-hour service.

The new equipment includes a specially designed recorder and repeater containing 10 individual units operating in rotation. Fresh weather reports are placed into the broadcast once each hour and more often when required. The broadcast usually can be heard up to 125 miles.

With most types of receivers the voice broadcast can be subdued so as to use radio range air navigation signals which are transmitted on the same frequency. For emergency communication, the broadcast can be cut off and the channel used for ground to plane broadcasts.

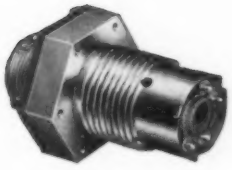
The Los Angeles installation is the first of its kind, although a similar experimental unit has been in operation in the Washington, D. C. area. There are plans eventually to establish 88 stations to provide a network covering the entire U.S.

Airways Plan Means More Electronics $ $

CAA's telescoped airways program should result in $40-$45 million in new business for the electronic industry, or about half of the $94 million appropriated this year for airways' establishment. CAA will place orders for electronic equipment this year that will be more than double what it has spent cumulatively in the past five years.

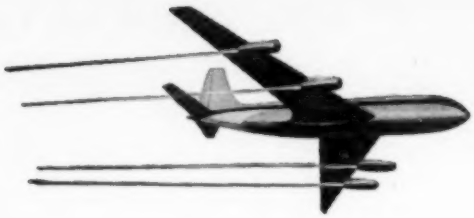
Because CAA is buying time in getting its five-year plan into effect in three years, contracts will be let on the basis of delivery schedule as well as the lowest qualified bid. CAA also expects to tap more than one source on certain items instead of awarding just one contract to one company in the interests of time.

Invitations to bid are being sent out as quickly as possible. Items to be ordered for the fiscal 1957 program and number of sources being asked to bid are: 156 VOR omniranges with 10-15 sources available; 25 airport surveillance radar systems and 31 long range radars, 20 companies; VHF-UHF ground communications equipment, 30 firms; airborne communications and flight check equipment, 20 companies. Balance of the establishment money is earmarked for structures, towers, cables and other components as well as installation costs.



This is a Honeywell Thermal Sensor which converts minute cooling variations into electrical signals. Honeywell has harnessed these signals for use in liquid level sensing systems having response times of from one to four seconds. These systems are ideal for in-flight and ground refueling, center of gravity control, and independent high and low level warning systems. Lightweight, simple, safe, they are vital to precision aircraft fuel management.

AERONAUTICAL DIVISION, MINNEAPOLIS-HONEYWELL



Good Service is Good Business

The importance of service is perhaps better understood by airline operators than by any other group of businessmen. The phenomenal growth of the airline industry itself is based on a dynamic program of constantly striving for better and ever better service standards.

We, of the Scintilla Division of Bendix*, have over the years made every effort to aid the airlines in accomplishing this worthwhile achievement.

Service to us means: producing the finest and most modern ignition equipment that creative engineering and manufacturing skill can achieve, and, of equal importance, service means backing this equipment with a complete and efficient organization of trained service specialists whose every effort is given to insure that the customer receives full benefit of the quality and performance built into the equipment. Our extensive service organization has specialized in ignition equipment for over thirty years.

Airlines specifying Bendix jet ignition equipment have the definite assurance that jet service will in every respect match the excellent service we have given on piston engine equipment that has made Bendix—The Most Trusted Name In Ignition.

*Trademark

SCINTILLA DIVISION OF BENDIX AVIATION CORP., SIDNEY, N. Y.

Bendix produces complete ignition systems for jet engines; Bendix field service is the most complete in the industry.

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Circle No. 14 on Reader Service Card.

Uniterm: New Logic for Scientific Research

'Access words' speed up storage and retrieval of information much the same way data-processing machines handle numbers.

By HENRY P. STEIER

"You're not talking today about the right and the left hands each knowing what the other is doing. You're talking about an octopus."

This is the way the problem of technical information dissemination in the big push for U.S. technological supremacy was expressed by Lynn Bartlett, Jr., president of Information for Industry, Inc.

Information for Industry was organized in March, 1955. Its purpose is to give information service to technical research. Organizing and coordinating technical research is playing a bigger role in our purposeful conquest of the future than ever before.

The techniques of formal logic that IFI is applying to its job are being sold to industry in the form of a patent service. However, the service grew out of a military need for better organization and coordination of information and has been applied to military projects for a number of years.

After World War II the government recognized the need for a better way of storing and retrieving the mass of technological data at hand. Obviously the job fell into the category of library science, but that science needed some new application of logic.

• **Storing and retrieving information** is a problem that has faced American business for a long time, but it is now admitted to have reached unmanageable proportions. Where to file it? How to file it? Where to find it? These questions plague all participants in modern society from stenographers to scientists.

Modern business sails on a sea of paper. Most of it is in file cabinets. The information on paper, for many, is becoming hopelessly inaccessible by reason of sheer volume, and vagaries of classifications and indexing language terms used to try to make it retrievable.

Language Inadequate

It is unfortunate that language does not have the logic that exists in numbers, or that number combinations could not easily be remembered as a substitute for words. Storing and retrieving information would be much easier if this were so.

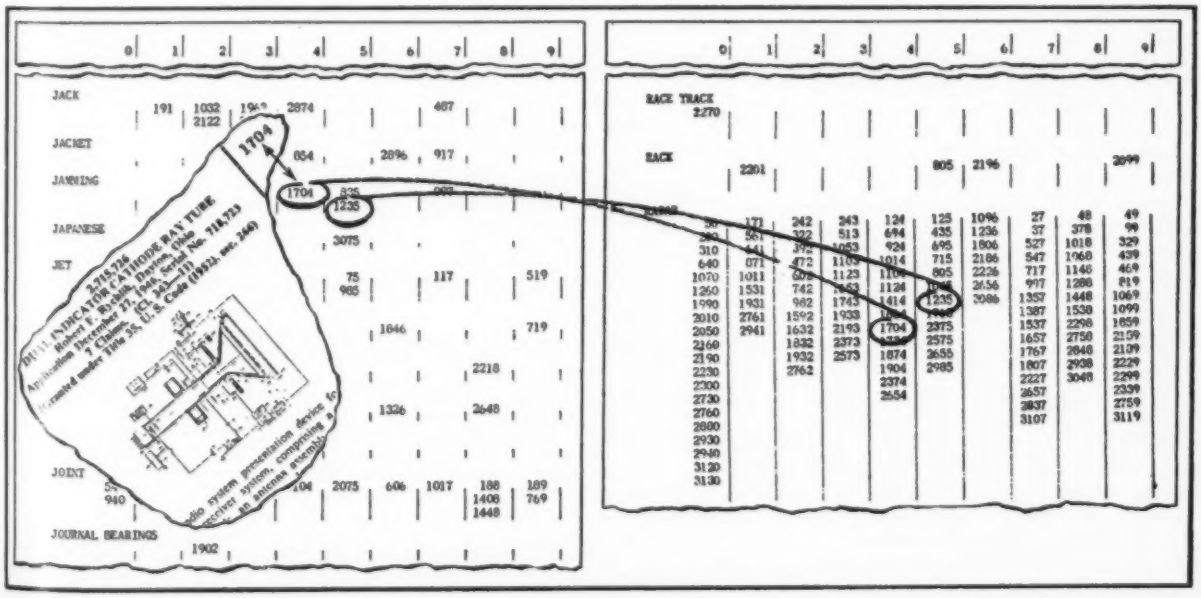
However, we have a word language and must live with it, even though it often fails to be logical in its application. Every minute of the day people pick and choose words to get information and to file information. Unfortunately they do not all use the same terms to describe the same thing.

• **Recent elevation** of the Air Office of Scientific Research to a position on a level with other Air Research and Development Command Centers is testimony that in the engineering sciences need-to-know is acute.

The first order of business for OSR is systematic sharing and communication of new ideas. This is being done to aid scientists to know what is going on outside their specific fields, and to speed-up the "chain-reaction" described recently by Dr. Irving Wolff, vice president-research, RCA, as the effect in which "discoveries generate new discoveries."

Faced with a conglomerate mass of information held in tens of thousands of technical reports and with more in development, the armed services in 1953 organized an agency to attack the task of organizing information storage and retrieval methods.

The Armed Services Technical Information Agency (ASTIA) was formed by the Defense Department. Then in



In a new system designed to aid research, pages in an index would be turned to find numbers common to UNITERMS. Uniterms are vocabulary "bits." When combined as shown for "jamming" and "radar" they narrow down an idea. By comparing numbers common to each Uniterm new patent ideas can be quickly found in a number index as shown by inset. Prepared by Information for Industry, Inc., the Uniterm system is being used by another company, Documentation, Inc. Documentation conceived idea and has been using it for military state-of-the-art information handling.

1953, Mortimer Taube, a logician with a PhD in philosophy and chief of the Atomic Energy Commission's technical information service, told ASTIA he thought he could help them.

With a $35,000 contract from the government, Taube organized Documentation, Inc. The concept of the *Uniterm*, being used by IFI in its service, was then developed under Documentation, Inc. Uniterms are access words that speed up retrieval of filed information and permit handling language in a way very much like the way computers and data-processing machines handle numbers.

Idea Basically Simple

• **Like good logic,** the Uniterm idea is startingly simple. However, just as with computers, a program language must first be established. In a given scientific field that is to use the Uniterm system, a vocabulary must be established.

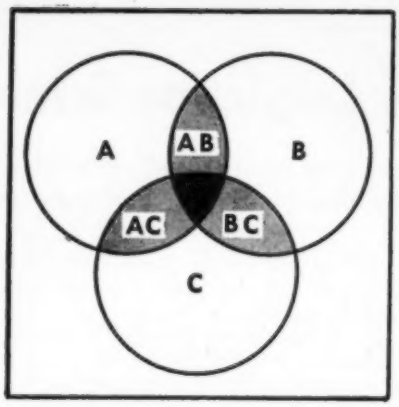
Under what category is a document to be indexed? This is the universal problem, in any business. In the engineering sciences it is getting more and more difficult to make this decision.

As Bartlett put it, "In the field of chemistry, all you have to do is knock two beakers together these days and you have a new compound." A report on the compound might have many basic words under which the material could be indexed in a file. A researcher could look a long time for all information on one of the multi-named chemical combinations.

The same is true in electronics. The word combinations are practically unlimited as this field expands its application and complexity. An electronic idea might easily include electronic terms together with atomic science and chemical terms. An atomic clock recently patented operates using frequency modulated waves whose passage through a crystal produces pulses because of the atomic structure of the crystal. The combination of ideas here would perplex anyone selecting cross-indexing words, and multiply the size of the file. Knocking together two transistors and a battery produces many new electronic "compounds" also.

To apply Uniterm the total number of subject headings must first be determined. The total number is less than one would think. For their patent service on electronics IFI found 2,911 words to be all that were necessary.

• **According to Eugene Miller,** vice president of both Documentation, Inc. and IFI, the average college graduate has a vocabulary of 3,000 words. So a user of Uniterm would have little trouble fitting his between the ears "computer" vocabulary to that of the system.



Representation of foundation for the Uniterm concept. Each circle encloses all information on subject named. Shaded areas represent information common to two subjects. Dark area symbolizes information common to three Uniterms. These might be for example radar-traffic-control.

A new electronics patent index just published by IFI illustrates application of the Uniterm system. Each patent issued in 1955 is given an index number starting with "1" for the lowest patent number and then consecutively on up to the highest patent number. This in the 1955 index was 3,130, the total number of electronics patents issued in that year.

Then a corps of electronics engineers surveyed the patents for single-word subject headings, or Uniterms. Some for example are: accelerometer, calibration, casing, climb, rate, radar, jamming, "wobbulator," etc.

These subject headings represent a broad interpretation of the electronics art. They might be components, materials, properties, circuit, arrangements, systems, applications, techniques, etc.

The headings are printed on looseleaf cards in alphabetical order. Two identical sets of cards are placed side by side in a looseleaf folder. As in language, any combination of these terms would define more specific or narrower concepts than a single Uniterm.

Posted under each Uniterm on the cards might be any of the numbers from "1" to "3,130" representing those patents that contain information dealing with the Uniterm subject.

• **In the IFI index** two identical sets of cards are placed side by side in a looseleaf card binder. A researcher who might wish to find patent information dealing with "radar jamming" would open one set of cards to "radar" and the other to "jamming." By comparing index numbers which are the same and which appear under each of the two Uniterms, the searcher can find patents which apply to radar jamming.

If an even narrower area of information is desired, three Uniterms may be compared. An item such as *"counters in frequency-modulated altimeters"* would call for picking out all common index numbers that appear beneath each of these words in the index.

IFI supplies another index containing U.S. patent numbers, patent name headings, and one primary claim together with a patent drawing. These are printed from the Official Gazette of the

Assignments of Electronics Patents Issued in 1955

• **Total number of patents** issued in 1955 was 3,130. Division of the total according to the assignees' major field of endeavor was: entertainment and appliance industry, 674; telephone, telegraph and teletype, 264; atomic energy, 220; aircraft and guided missiles, 151; petroleum, 92; business machines, 72; no specific field, 1,657.

• **Corporate patent assignees** receiving the major numbers of patents were: Radio Corp. of America, 262; Bell Telephone Laboratories, 170; General Electric Co., 118; Westinghouse Electric Corp., 85; International Telephone and Telegraph Corp., 51; Bendix Aviation Corp., 50; Raytheon Manufacturing Corp., 44; Stromberg Carlson, 32; International Business Machines Corp., 30; DuMont Laboratories, 29; Sperry Rand Corp., 26; Collins Radio, 24.

• **Federal Agencies*** as assignees receiving patents were: Secretary of the Navy, 150; Atomic Energy Commission, 80; Secretary of the Army, 46; Secretary of War, 46; Secretary of the Air Force, 10; Secretary of Commerce, 8; Secretary of the Interior, 2; Secretary of Agriculture, Reconstruction Finance Corp. and U.S.A., 1 each.

• **Airframe companies** as assignees received a total of 31 patents as follows: North American Aviation, Inc., 12; Northrop Aircraft Inc., 11; Boeing Airplane Co., 3; Douglas Aircraft Co., Inc., 2; Bell Aircraft Corp., 2; Fairchild Engine and Airplane Co., 1.

* Old applications.

(Information above was obtained from a newly prepared Index using the "Uniterm" unit of vocabulary for quick access to the information. The Uniterm Electronics Patents Service is being offered by Information for Industry, Inc. Electronics patents issued in the first six months of 1956 mounted to 3,084. This indicates accelerated work by the U. S. Patent Office in catching up with a reported backlog of 225,000 applications as of Oct., 1955.)

U.S. Patent Office. These "briefs" are filed in the index in serial fashion by numbers from "1" to "3,130."

The Electronics Uniterm Index also contains lists of patent assignees, official patent numbers and patentees, all keyed to the IFI assigned patent numbers.

What has been achieved by this application of the Uniterm idea is the development of what data-processing engineers call a Random Access File. Said Dr. Taube: "There's nothing a big electronic computer can do that you cannot do with a set of hand sorted cards."

Searching for Machines

• **Meanwhile, engineers** in the data-processing field are searching for machines that will do the job now being done by Uniterm. Dr. Taube said Documentation, Inc. is also searching for an effective machine technique using Uniterm.

The big factors in machine searching are cost and vocabulary. The ideal would be a true random access machine. Information stored on magnetic tapes and drums must generally be pulled out by running through all the information recorded until the item wanted is reached. This sequential search method wastes time and costs money in terms of equipment needed.

Other devices use a multiplicity of reading heads to narrow down the search speed needed. Companies like International Business Machines, Inc. and others in the field have been looking at Random Access techniques using juke-box type recording disks in great numbers.

In this way items can be separated mechanically. Still the systems end up as sequential random access devices. A separate reading head and disk for each bit of information becomes the undesirable ultimate when the disk idea of random access is carried to the extreme for quick access time.

• **Closest to the idea** of a machine specifically developed and in use for information-searching is the Minicard library developed by Eastman Kodak Co. It is said to permit a 1,000-to-1 reduction in space requirements for storing information. It was designed to automatically search for and extract information from a library of film strips containing photographed information.

Short filmstrips are placed on skewers. An indexing code is printed along one edge of the strips. Slits along the edge fit over the skewer. To select information the strips are photoelectrically scanned and selected for projection on a screen. This is done by operator choice of the classification terms in which he is interested.

Input to Minicard is a problem. Films must be made and, according to persons acquainted with the machine, published figures of storage space and speed assume equal loading of all pages of microfilmed information. This they say is not so.

• **At present** Dr. Taube is pursuing the idea of a generalized storage and retrieval vocabulary for use with a low-cost system. IFI previously prepared a Uniterm index for 6,065 chemical patents issued in 1955.

According to Taube, the older chemical industry vocabulary is more "hardened" than in the electronics industry. Establishment of a generalized vocabulary acceptable to all industry for information-handling by Uniterm means will probably be easier in chemistry than in the electronic case.

The chemical industry has already shown great interest in the Uniterm patent index service, with names like Standard Oil Co. of Indiana, Esso Research and Engineering Co., Dow Chemical Co. and Celanese Corp. of America listed among the many clients.

Electronics Industry Interested

The electronics industry has already shown interest in both the patent index service of IFI just published and also in its application to their internal research problems. Some of the electronics giants in the U.S. are considering going over to Uniterms for all their filed information. Others are viewing it cautiously with an eye to "we'll see what happens." In any event, the "Ask Sam" method of retrieving information is becoming recognized as nearly useless in modern research and development activity as not filing it at all.

• **To keep up** with the growing complexity of accomplishments outside their individual specialized fields, engineers are going to need aid in searching the field for ideas. The weapons system concept is a manifestation of the accomplishments possible when there is a real cross-breeding of ideas from all the sciences.

This Uniterm principle is being put to use now by the Office of Scientific Research in its quest for new cockpit instrumentation principles that show TV or other pictorial information in place of numbers and letters that require mental conversion.

Spearheading this effort is the Douglas Aircraft Co. With a feasibility contract awarded by OSR, Douglas is studying the state-of-the-art in instrumentation on a continuing basis.

• **Among the 24 sub-contractors** playing a part in the program is Documentation Inc. For two years, Documentation has been collecting reports, abstracts and other information on the instrumentation problem. The organization and coordination of this work is being handled with the Uniterm system.

So far 12,000 reports have been collected and analyzed for Uniterm indexing. Although classified and unclassified information is included in the instrumentation index, it is sent as a classified package each six months to participants in the program. It is also sent to some 400 other interested groups.

Some idea of the unification of ideas that can be achieved will be realized when it is considered that there are 546 names on the instrumentation index mailing list. Users of the information will probably exceed that number by many times. The vocabulary of their work will undoubtedly become more uniform and understandable, ideas better integrated, manpower better used.

Dr. Taube believes the day will come when a central agency will be quickly able to answer all questions put to it by anyone. Machines will perform rapid searches and information may even be transmitted by wire or radio in a few minutes after the questions are asked. ◈ ◈ ◈

GE Gets $12 Million Data-Link Contract

General Electric Co. has received a $12-million Air Force production contract for airborne data link units. The units will be used to receive coded instructions in digital form from ground-based control systems such as SAGE.

The units to be produced by GE's Light Military Equipment Department will be used to receive heading, altitude and speed information for pilot guidance in the initial stages of interception missions.

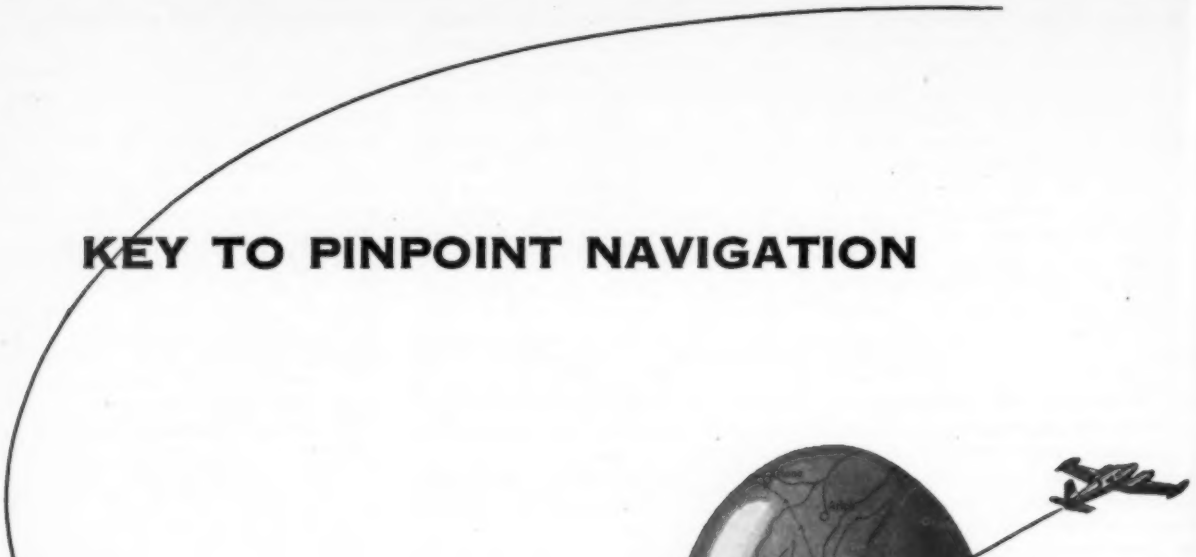
Data received by ground-based radars in the air defense system will be computer-processed and then automatically radioed to individual aircraft. GE said the intercept information could also be fed to aircraft for automatic control or to guided missiles.

Total estimated expenditures for airborne radio equipment in the Air Force program requirement for 1956 was given as $49 million in House Appropriation Subcommittee hearings earlier this year. Estimate for 1957 was given as $151 million.

Skiatron Adapts Tube

Skiatron Electronics and Television Corp. has adapted its Dark Trace tube for use with a data inserter system. The Dark Trace cathode ray tube retains an image indefinitely until it is deliberately erased electrically. Now, a system developed for the Navy permits an operator to superimpose pertinent data on a dark trace tube radar image and then transmit both types of data over a telephone line.

KEY TO PINPOINT NAVIGATION



Omni/ILS Plus **ARC's** *New Course Director*

This new and advanced navigation instrumentation system is a complete PACKAGE, consisting of single or dual omnirange equipment, teamed with the new ARC COURSE DIRECTOR.

The COURSE DIRECTOR consists of a computer which gives precise steering data and a compass slaved gyro which provides *stabilized*, accurate, directional information.

The system supplies the pilot with AUTOMATICALLY COMPUTED steering information on all ENROUTE OMNI TRACKS, HOLDING, INBOUND, OR OUTBOUND ILS OPERATIONS, thus providing PRECISE APPROACHES. Complete automatic crosswind compensation is provided for ALL operations.

The computer performs all your calculations and presents correct steering data directly on the cross-pointer meter. The gyro needs no resetting at any time, since precession is completely compensated. *You simply set in your selected course and steer to keep the needle centered.* The system will then either intercept or precisely follow the desired track as required.

So – fly with pinpoint precision – greater ease and increased safety. See your nearest ARC Dealer or write us today for complete detailed illustrated literature.

Omni Receivers • 900-2100 Mc Signal Generators • UHF and VHF Receivers and Transmitters • 8 Watt Audio Amplifiers • 10-Channel Isolation Amplifiers • LF Receivers and Loop Direction Finders • CD-1 Course Directors

Dependable Airborne Electronic Equipment Since 1928

Aircraft Radio Corporation BOONTON, NEW JERSEY

Circle No. 15 on Reader Service Card.

Why Lear is Optimistic About European Move

One of the extracurricular activities William P. Lear has undertaken in his novel European venture is an educational campaign to get Europeans to quit referring to business planes—like his Cessna 310—as sport planes.

This is a throw-back to an old attitude toward aircraft of this type and it has deterred business flying progress in Europe. But it's growing now and Lear predicts that in the next five years it will advance to the point where it equals business flying in the United States; perhaps even exceed it. Particularly if they'll drop the term "sport plane" from the category.

Lear, Inc., with its new subsidiary system in Europe, is out to help the cause along in a practical way. Its first contribution along this line will be a complete service setup for radio, radar, direction finder, omni, autopilot and approach coupler and similar equipment at the Swiss subsidiary's base at Geneva.

William P. Lear

Exploring Opportunities

Bill Lear didn't establish his headquarters in Geneva—in September, 1955—primarily to lend a helping hand to European business flying. That's a bonus. He went to Switzerland to explore the opportunities in the European area for engineering development and new products. Subsidiaries have been formed at Geneva and at Munich, Germany, and will be retained on a permanent basis, he said.

• **One reason** Lear is confident business flying will grow so rapidly in Europe is that it is easier to build new airports than it is to build new roads. The property ownership system in Europe makes it more difficult to obtain rights-of-way than to buy a parcel for an airport site. "Transportation growth in Europe will be in the air," said Lear.

Omnis also are now being established in Europe, where in the past pilots had to depend on radio direction finders. Lear's estimate is that there will be 50 omnis in operation in Switzerland and the free countries bordering it within another year.

Lear already has sold two Learstars in Europe and in October he flies his own Learstar over to be based at Geneva. Meanwhile, the Cessna 310 he is now flying has become one of the most widely known business planes in Europe because of his frequent flights to Frankfort, Munich, Paris and other points, including through the corridor to Berlin.

Airport personnel call him Mr. B. L., not for Bill Lear, but for blind landing, because of the ease in which he flies weather. There's a keen interest in Europe in instrument flying, Lear reports.

• **In Santa Monica recently**—on his sixth trip so far this year in "commuting" between his new home in Geneva and his company's general offices in California—Lear told AMERICAN AVIATION his company had received several offers from European interests seeking to buy into the Lear operation, but that all had been rejected.

"We want to retain the freedom of a wholly-owned operation," said Lear.

He also declared he was even more enthusiastic now about the long-range possibilities of the European venture than when he first went over. One reason for this is the quality of the engineers available. "We're getting very good engineers with fine training in fundamentals," Lear said.

They're not easy to hire, however. It takes three or four months of negotiations to land an engineer in Europe. In the first place, employment is 100% in West Germany, Switzerland and England. Then, Europeans emphasize long-range security—they like to work for one company over a long period of time—and a U.S. concern locating in Europe is apt to be suspected of being only temporary. Lear is answering this with plans for the building of its own facilities to take the place of the present leased facilities both at Geneva and Munich.

• **Lear's Swiss subsidiary** now has about 80 employees on the job at Geneva, 12 being design engineers.

It is Lear's plan to remain in Europe for about two more years, after which he will return to Santa Monica. At that time, his son, William P. Lear, Jr., is scheduled to head up the European operation. Young Lear recently joined the firm in Geneva after a term with another company in Texas.

That Russian Mixup

Lear's recent Santa Monica visit was his first since his flight to Moscow which resulted in so much misinformation in news dispatches from the Russian capital. The trouble was caused by a reporter, who knew little about aviation or Bill Lear, and built up a dispatch indicating the manufacturer had exposed classified equipment to the Russians. Bill's Cessna 310 was well equipped, but with nothing that anybody couldn't have bought off the shelf from a Lear distributor in Europe.

Lear's comments on the Tu-104 jet transport, which he inspected in detail, are interesting. The radio equipment, he said, was identical with that produced by Bendix in 1940 to 1942. The autopilot was the same as a C-2, the Norden bombsight autopilot made by Minneapolis-Honeywell. The directional gyro control was in the nose of the aircraft, or as Lear put it, "right where it belonged on a bomber." VFH navigation equipment was the same as an SCR-522 in every detail, including the four frequencies.

The mapping-type radar looked as if it had just came off the shelf of one of our American radar manufacturers—and, again, it was right down in the nose where it obviously could be used for bombing purposes. The Tu-104 had two radio altimeters, one called a high-altitude altimeter, the other one called a low-altitude altimeter. Lear said the Russians are reported to have become proficient in making low approaches, using a direction-finder and a beacon at the end of the runway and the altimeter. He assumed this was the reason for the dual altimeter arrangement.

Lear said it was evident not much is being done in developing radio and navigation equipment for aircraft in Russia. But he said he felt the Russians probably were jumping over the equipment for automation, navigation and communication in aircraft to concentrate on ultimate weapons.

"In other words, they're not behind in the development of things they regard as more important," explained Lear. ◆ ◆ ◆

F-104A Meets the 'Heat Barrier'

By FRED HUNTER

Whatever else the Russians may have, they don't have anything as fast as the Air Force's F-104A.

This comforting assurance comes from W. P. Ralston, chief project engineer on Lockheed's new fighter. With the F-104A, the air industry is now pushing the heat barrier, says Ralston.

• **We're on the outer limits** of plastic canopies, because more speed would cause them to soften and fail, Ralston explains. "And I mean right on the border," he added. "If it weren't for the cool air in the cockpit—to make it livable for the pilot—we would be past the limit."

If an airplane to go faster than the F-104A is to be built, it will have to have something besides plastic for the bubble over the pilot's head, the Lockheed engineer declared.

The F-104A uses few critical materials, Ralston disclosed. It has only a few pounds of titanium and no forgings requiring use of the Air Force's heavy press program. It's an airplane that can be built in any competent aircraft factory.

• **Ralston revealed** that in certain heat regimes Lockheed's designers found they could actually save weight by using heat treatable stainless steel instead of titanium. It was also found that use of aged 24S aluminum in other heat ranges could save weight over normally stronger 75S. Latter loses strength rapidly at temperatures over 250 degrees. At 250 degrees, 24S also loses strength, but more slowly.

Any time you see a picture of the F-104A, you'll note dust covers over the air inlets for the engines. They're to keep out dust and also to guard the configuration of the inlets from prying eyes. Lockheed's air inlet design is not only a military secret, but a trade secret. The F-104A has the best inlet air distribution of any aircraft, Ralston avers. The configuration provides higher ram to the engine; important at Mach 2 (more than 1,300 mph above 30,000 feet) when the engine with its afterburner is developing half its thrust as ramjet.

Lockheed's preliminary design group designed more than 100 airplanes before putting together the final blueprints on the F-104A. Before arriving at the short, stiff wing, which is one of the speed secrets of the F-104A, Lockheed designed dozens of swept-wing and delta-wing planes, Ralston said. The F-104A wing carries dynamic loads of more than a ton per square foot.

• **The Lockheed fighter** is neither a hot-rod nor a stripped-down job, Ralston explains. "It's a pilot's airplane," he declared. Herman Salmon, Lockheed's chief engineering test pilot, described the super speedster as "easier to fly than the T-33."

But cutting weight to a minimum was one of the three avenues Lockheed traveled in making the F-104A so fast. The other two were to cut drag to a minimum and to find a suitable engine to fit the plane's small frontal area. The latter was accomplished by using General Electric's J79 engine. This is about the same size and weight as the Curtiss-Wright J65 that powered the prototype XF-104, but develops more thrust. Lockheed had 230 engineers assigned to the F-104 project.

Lockheed attacked the weight problem by setting up a target weight and then apportioning so many pounds to each design group. Each group supervisor broke up his components into pounds. Then each designer set out to beat the weight he had been assigned.

In fashioning an airplane weight is saved not by whittling, but by making one thing do the work of two or three, Ralston pointed out. For example, the F-104A's dive-flap housing had to be strong enough to take the loads when the flaps are opened at high speed. There is no need for this strong structural member to use up weight for only one purpose. So, on the F-104A, it serves as dive-flap pivot fitting, air engine mount fitting and splices the bulkhead together.

"And just to make it lighter we used part of the strength of the dive-flap hydraulic cylinder to make up the strength of the housing," said Ralston.

• **The downward ejection seat** in the F-104A weighs slightly more than an upward ejection seat, but it saved weight overall because it has a simple unlatch-it-and-open-it-yourself canopy instead of a power-operated canopy with heavy rollers, heavy framing and electric-motor drive screw jacks. A power-operated canopy weighs 2½ to 4 times as much as the canopy on the F-104A.

Despite its high performance capabilities, the F-104A has a reasonable price tag, Ralston said. Actually, he said, the Air Force can buy two of the lightweight F-104As for the price of one big jet fighter. Lockheed also has "productionized" the plane for high rate production. If need be, it could turn out 15 planes a day.

Ralston estimated that by making the F-104A easy to build Lockheed would save the Air Force $38,000,000.

Selected by the Royal Navy and the Royal Air Force

the GAZELLE 1,260-2,000 s.h.p. Gas Turbine Engine

This rugged new free-turbine engine of notable performance for gas turbine-powered helicopters will power the twin rotor Bristol 192, adopted by the Royal Air Force and the Westland S.58 "Wessex" helicopter, adopted by the Royal Navy.

The engine embodies the safe, simple Napier automatic control system.

For ease of installation it can be mounted in any position between the vertical and horizontal.

Helicopters demand tough, reliable engines—the GAZELLE is designed for strenuous duty, long life between overhauls, while its outstanding simplicity means easy maintenance and economical operation.

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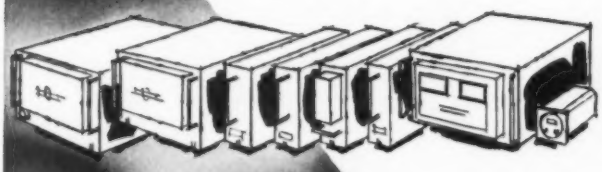
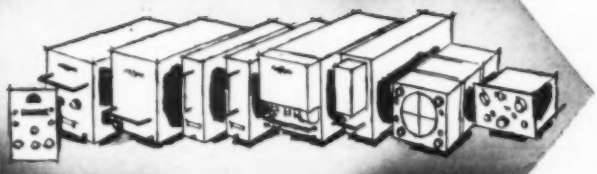
Partners in Progress with The ENGLISH ELECTRIC Company Ltd.



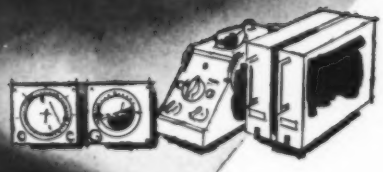
COMMUNICATION

Only Collins offers such a complete line of communication equipment—VHF, HF, HF SSB, Interphone and Selcal. Modularized, transistorized, each with an integral, removable power supply. The latest unit, the Collins new SSB 1 KW transmitter-receiver, will set the new standard in global operations.



NAVIGATION

Collins, as always, the leader in navigation equipment, brings this new package which includes ADF, VOR receiver and instrumentation, ATC Beacon Transponder, Marker and Glideslope Receivers, and Weather Radar. Representative of the new lightweight navigation equipment is the 15 pound ADF Receiver built to ARINC Characteristic 530A.



CONTROL

Using Collins control package, smooth, precise, flight control is achieved with Collins tubeless, modularized Automatic Pilot. Outstanding instrumentation is provided by Collins Integrated Flight System—the original; the IFS also gives excellent manual flight control.

Call the nearest sales office for information, or write for the new Airborne Electronic System brochure.

Collins CREATIVE LEADER IN AVIATION ELECTRONICS

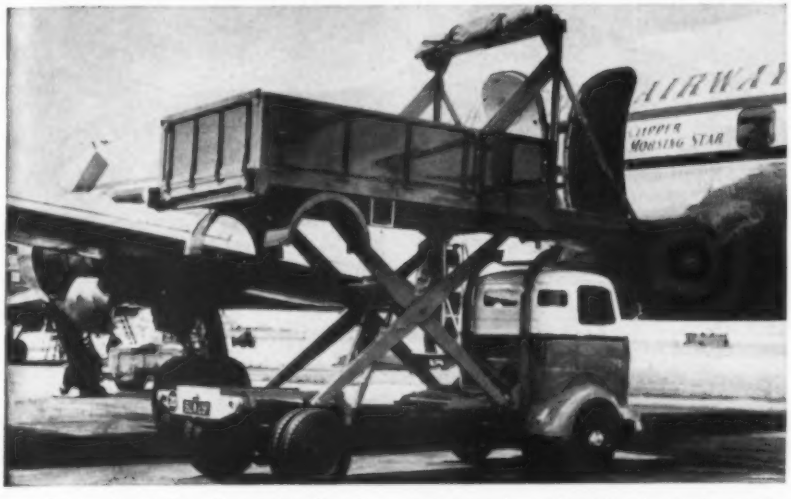
COLLINS

COLLINS RADIO COMPANY, 315 2ND AVE., S.E., CEDAR RAPIDS, IOWA; 1930 HI-LINE DRIVE, DALLAS 2; 2700 W. OLIVE AVE., BURBANK; 261 MADISON AVE., NEW YORK 16; 1200 18TH ST. N.W., WASHINGTON, D.C.; 4471 N.W. 36TH ST., MIAMI 48; 1310 4TH AVE., SEATTLE. COLLINS RADIO COMPANY OF CANADA, LTD., 11 BERMONDSEY ROAD, TORONTO 16, ONTARIO • COLLINS RADIO COMPANY OF ENGLAND, LTD., SUNFLEX WORKS, COLHAM MILL ROAD, WEST DRAYTON, MIDDLESEX.

Circle No. 17 on Reader Service Card.

New Products and Processes

CARGO LIFTER



A truck designed specifically for use in loading and unloading cargo from aircraft, tradenamed the Karrier Gamecock ¾-ton cargo lifter, has been introduced by **Rootes Motors Inc.** One of the first trucks made was purchased by Pan American World Airways and is being used at London Airport.

The body of the lift is mounted on an 11-ft., 9-in. chassis powered by an under-floor six-cylinder engine. A lever inside the cab actuates scissor cross-members that lift the body to the height required. When the body reaches cab roof level, a "drawbridge" swings down over the roof, extending the floor of the body 5 ft. 6 in. over the top of the cab.

The automatic folding headboard that can be varied in size to fit the loading bay of almost any large aircraft in use. The truck rises to a height of 10 ft. 4 in. from the ground and carries a load of three tons.

Circle No. 151 on Reader Service Card.

AVIATION BATTERIES

Exide Industrial Division, The Electric Storage Battery Co. has developed a series of improved aviation transport batteries with increased reserve power, higher capacity performance and longer service life.

The batteries have Silvium alloy positive grids, a lead oxide active material designated GOX and Pormax plate separators. Silvium, a patented alloy of silver, lead and other metals, is said to provide added reserve power. Exide says Silvium has the highest resistance to electrolytic corrosion yet attained in lead-acid battery grid alloys. This enables the battery better to withstand abuse of overcharging on long flights.

Pormax is a polyvinyl chloride separator material permitting freer electrolyte penetration while providing superior plate insulation.

Circle No. 154 on Reader Service Card.

AIR-START HOSE & COUPLING

Two new products have been developed by **Roylyn, Inc.,** a dacron-covered air-start hose and a ruggedly built coupling.

The hose has two inner layers of high-temperature silicone bonded inside an outer cover of closely woven dacron. Available in lengths up to 60 feet, it is said to have many advantages over other types of hose now being used. The manufacturer says it will operate satisfactorily without burst at pressures near 300 psig.

No special equipment is required to repair the hose in the field. A damaged section can be cut out with a knife. However, a Roylyn repair kit is available.

The Roylyn coupling has been strengthened by a steel reinforcing ring that extends over its nose. It was drop-tested successfully, under Air Force procedure, more than 500 times, from a height of six feet. It provides two methods of disconnect, lanyard and manual.

Circle No. 153 on Reader Service Card.

FUEL BOOSTER PUMP

A new fuel booster pump, Model RR-11650, developed by **Lear Inc.'s Lear-Romec Division** is designed to separate vapor bubbles from fuel to prevent vapor lock.

It has a centrifugal-type impeller and a vapor-separating impeller installed on the motor shaft. Suitable for JP-4 fuel or high-octane aviation gasoline, the totally submerged unit transfers fuel between tanks or boosts fuel to engine fuel system of aircraft.

Performance is 42,000 pph at 15 psi minimum. The 2.75 hp motor is uniformly cooled through direct contact with the fuel into which the unit is submerged.

Circle No. 190 on Reader Service Card.

DOUBLE-LOCKING COUPLINGS

Janitrol Aircraft-Automotive Division of Surface Combustion Corp. has introduced a new line of couplings featuring a clamp with a double-locking safety catch.

Tradenamed Dubl-Lock Couplings, they are designed for applications in which maximum safety is required, such as for high-pressure air ductwork passing through cockpit and cabin areas. Should the locking bolt shear

or otherwise fail, a barbed tang prevents coupling failure by maintaining the seal. The tang is automatically drawn into locking position when the bolt is tightened.

The couplings are available in 13 sizes, approximately paralleling the company's standard line of couplings. Literature is available.

Circle No. 191 on Reader Service Card.

OVERHEAT DETECTOR

A windshield overheat detection unit based on a thermistor is being produced by **Fenwal, Inc.**

Designed to prevent overheating and damage to aircraft windshields, the unit can also be used for temperature control. It consists of a sensing probe containing a thermistor detector and a compact control box containing the amplifier and control circuit.

The detector is adjustable to operate over a range of 170-270°F. with a maximum differential of ±10°F. throughout the range. Other ranges are available with circuit modifications.

Circle No. 192 on Reader Service Card.

RADAR TEST SET

A radar test set for check-out of radar and other microwave transmitters has been announced by **Kearfott Co., Inc.,** Western Division. The set is self-contained and available in C-band, X-band, and Ku-band (15,000 to 17,000 mc) frequencies. Included are spectrum analyzer, power monitor, direct-reading frequency meter, signal generators with variable pulse, saw tooth and square wave modulation.

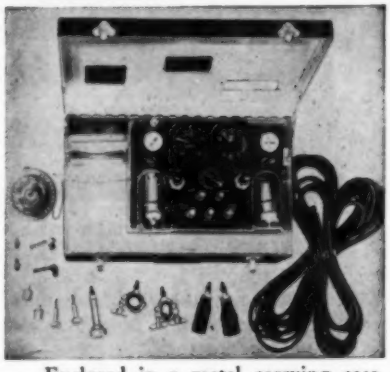
A check indicator with simulated echo provides signal for standing wave measurement. Operation is on 103-125 volts, single-phase alternating current from 50 to 1,200 cycles. Net weight is 75 pounds and unit measures 21½ x 14½ x 17⅞ inches.

Circle No. 197 on Reader Service Card.

PITOT-STATIC TESTER

A pitot-static tester developed by **Aircraft Products Co.** for the U.S. Air Force is now available commercially.

Designated APC Model 381, this unit is used to test the pitot and static systems of aircraft for leakage and to check the operation and calibration of flight instruments such as airspeed indicators, altimeters, rate-of-climb indicators and machmeters.



Enclosed in a metal carrying case, the tester includes a hand-operated vacuum pump, five control valves, vacuum and pressure gauges, a 0-to-50,000-ft. altimeter, an air speed indicator, a thermometer and a circular, slide-rule-type computer. It weighs 23 lbs., measures 6″ high, 10½″ deep and 18″ long.

Circle No. 155 on Reader Service Card.

PILOT VALVE

A three-way solenoid-operated pilot valve designed for maximum leakage of 5cc per minute is offered by **Fisher Controls, Inc.**

Weighing 7 oz., the valves are suitable for service up to 3,000 psi in an ambient temperature range of —65°F. to 275°F. The solenoid is a continuous duty type with an operating range of 18-30 volts dc and a maximum drain of 1.0 amps at —65°F.

Designated the 100400 series, the valves meet requirements of applicable portions of MIL-V-5529A. Literature is available.

Circle No. 193 on Reader Service Card.

ALL-METAL MOUNT

An all-metal mount that isolates vibration from airborne electronic equipment in helicopters is offered by **T. R. Finn & Co.**

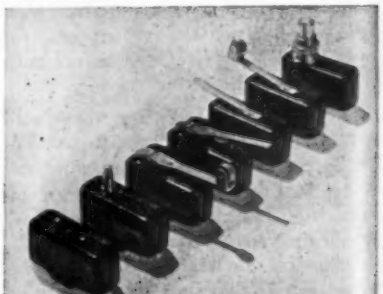
The problem of vibration in helicopters is complicated by low-speed rotating components and rapid changes in flying altitudes. This sets up severe vibrations characterized by low forcing frequencies and high excursions.

The Finn Series 600 mount was designed with a low natural frequency ranging from 4. to 4.5 cycles per second and a large deflection. It takes an extremely high excursion, ¼″ peak-to-peak load, with a magnification factor of 1.8 or less at resonance. Literature is available.

Circle No. 198 on Reader Service Card.

SWITCHES

Licon (R) Switch and Control Division, Illinois Tool Works has introduced a full line of standard limit switches for aircraft, machine tools and other uses.

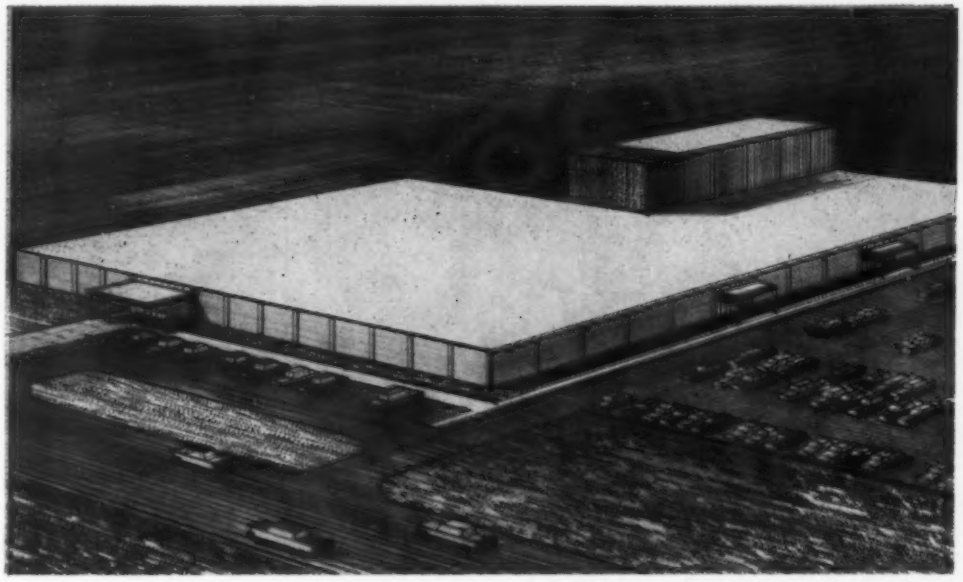


Type-10 series switches offer movement differentials less than .0005″ for use in operations requiring extreme sensitivity. The "serpentine" snap action is said to have given more than 10 million actuations in tests. Since the switches have no pivot points, they have no dead center and there is no flickering.

Type-10 series has a 15-amp. rating. A 20-amp. heavy duty type is also available.

Circle No. 152 on Reader Service Card.

This is Temco's new Engineering Center



E. G. Hamilton and George F. Harrell, Architects, Dallas

Idea center for new designs in complete aircraft and weapons systems . . . test-lab for tomorrow's planes and missiles . . .ultra-modern workshop for a growing force of engineers.

Increasing assignments for development of such Temco projects as the Navy's TT-1 jet primary trainer, plus important subcontracts in missile and electronics work, have doubled Temco's Engineering Department within the past two years.

Temco's new million-dollar Engineering Center is designed to permit further expansion at any time. Future programs, already under negotiation, promise yet another doubling in the immediate future.

What is This?

This is a blueprint for tomorrow's air transportation. It's Temco engineering at work on design of components for America's first turbo-prop airliner — the Lockheed Electra.

Temco's proven engineering ability was a deciding factor in earning this important assignment: engineering, tooling and manufacturing ailerons, wing flaps and tips, leading edge assemblies. For the commercial Electra project, Temco is providing the same drawing-board-to-delivery service that is currently at work on fourteen of the nation's top military aircraft.

Engineers: Openings in all phases of aircraft design and development; write to Engineering Personnel, Temco Aircraft Corp., Dallas, Texas

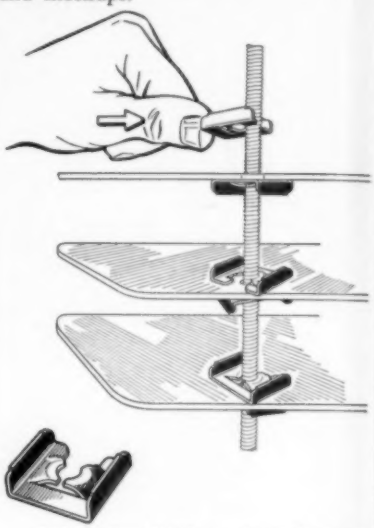
TEMCO

AIRCRAFT CORPORATION, DALLAS

NEW PRODUCTS

TEMPLATE FASTENER

Tinnerman Products Inc. has introduced a fastener for aluminum templates used for making plaster molds and mockups.

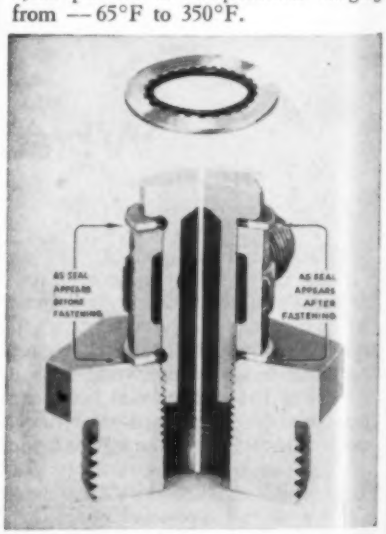


Called Speed Nuts, these fasteners are slipped onto threaded rods inserted into the templates. When tightened they hold the templates securely in place, as shown. Formerly, square nuts had to be threaded up the long template rods, a time-consuming hand operation.

Circle No. 156 on Reader Service Card.

SEAL FOR BANJO FITTINGS

A sealing device said to assure zero leakage of banjo fittings is offered by **The Franklin C. Wolfe Co.** It provides a seal against air, oil or fuel up to 5,000 psi and at temperatures ranging from —65°F to 350°F.



The manufacturer says the seal allows engineers to use banjo-type fittings in designs often rejected because of leakage. They are made in many standard sizes to facilitate retro-fit programs.

Circle No. 157 on Reader Service Card.

DIRECT-WRITING OSCILLOGRAPH

Consolidated Electrodynamics Corp. has developed a new direct-writing oscillograph for permanent recordings of frequencies up to 250 cps with a one inch amplitude. Voltages from carrier amplifiers, telemetering discriminators, d-c amplifiers, etc., can be recorded.

Type 5-301 Datagraph is used with a Type 1-133 amplifier. According to the manufacturer, response is flat to 250 cycles, and the unit is said to have excellent square-wave and transient response.

Circle No. 194 on Reader Service Card.

SYMBOL TEMPLATE

A new electrical symbol template for draftsmen is offered by **Keuffel and Esser Co.** The template was designed to conform with revised graphical symbols prepared by the American Standards Association and requirements of military specifications.

Leading companies in the electronics industry assisted in the selection and arrangement of the symbols. Available in three sizes, the unit carries 60 percent more symbols than K&E's old template.

Circle No. 130 on Reader Service Card.

RESIN TAPES

A new line of epoxy resin tapes offered by **Minnesota Mining and Manufacturing Co.** is designed to meet Class B electrical insulation performance requirements. Both Scotchcast tape X-1035, a glass cloth, and X-1045, a non-woven polyester mat, are said to have excellent handling properties.

Circle No. 174 on Reader Service Card.

NEW PRODUCTS

FLUX-METER

Federal Telephone and Radio Co., division of International Telephone and Telegraph has announced a magnetic flux meter that measures strength of a magnetic field along each of its three rectangular axis.

Called a 3-D meter, it measures three components instead of the single one ordinarily measured.

It is equipped with a probe that permits measurements in narrow spaces.

Range is 2 to 1,000 gauss in two full-scale settings of 200 to 1,000. Fields ranging from earth magnetism to 10,000 gauss can be measured by external meters. Basic sensitivity is 0.2 millivolts per gauss. The unit weighs 2½ pounds. Probe length is 12⅛ inches, and has a diameter of 0.435 inches.

Circle No. 195 on Reader Service Card.

Product Briefs

• **Cannon Electric Co.** has added a new line of sub-miniature connectors coded "MC" for use with miniature equipment using 5 amps. current per contact, for aircraft and electronic instrumentation. There are two insert sizes, eight receptacles and plugs, with 84 possible connector combinations.

Circle No. 158 on Reader Service Card.

• **Parker Appliance Co.** has developed a hydraulic O-ring compound, designated 47-761, to meet requirements of Spec. MIL.-P-18017 A.

Circle No. 159 on Reader Service Card.

• **The Deutsch Co.** has introduced new miniature push-pull connectors that connect and automatically lock by being pushed together. They were shown at the Western Electronic Show in Los Angeles.

Circle No. 160 on Reader Service Card.

• **The Lighthouse, Inc.** offers a rubber-housed light tradenamed Rubb R Lamp, designed to withstand the shock and vibration of takeoffs, landings, rough taxiing, cannon firing and similar conditions.

Circle No. 161 on Reader Service Card.

• **Integral Corp.** has developed a micro check valve in conformance with MIL-V-5524A, available in sizes from —4 to —32. Made in aluminum alloy or stainless steel, it may also be obtained in titanium. Models cover pressures to 5,000 psi with temperatures ranging from —65°F. to 275°F.

Circle No. 162 on Reader Service Card.

• **The Wakmann Watch Co.** offers a new 24-hour Type A-11 eight-day aircraft clock, Model W-33-7511, that features luminescent hands and figures and sweep second hand.

Circle No. 163 on Reader Service Card.

• **Kaynar Co.** has developed a lightweight hex nut that can be wrenched internally or externally, intended for use where space is at a premium. Available in sizes from Nos. 4/40 through 5/16-24.

Circle No. 175 on Reader Service Card.

• **Metal Products Manufacturing Division,** Arrowhead Rubber Co. is producing two types of stainless steel bellows tie-rod assemblies for use in pneumatic ducting systems of turbojet and turboprop aircraft.

Circle No. 176 on Reader Service Card.

• **Anderson, Greenwood & Co.** has developed a spring-loaded check-relief valve to maintain a balanced load between converters in aircraft liquid oxygen systems with multi-converter installations.

Circle No. 177 on Reader Service Card.

• An electronic unit that automatically controls exposure in motion pictures has been announced by **Flight Research, Inc.** Heart of the unit is a light-sensitive device that actuates a motor to turn any number of lens-aperture rings.

Circle No. 180 on Reader Service Card.

• **Maxson Instruments,** a division of the W. L. Maxson Corp., is manufacturing an acceleration-sensitive switch suitable for use where instruments, controls or safety devices are required to operate at a predetermined acceleration level.

Circle No. 181 on Reader Service Card.

REPUTATION IS BUILT ON PERFORMANCE

For more than a quarter of a century, leading airlines throughout the world have been using Air Associates seat belts. Foolproof, simple to fasten and comfortable, these belts have proven themselves—beyond doubt—for performance and long service.

The latest refinement in seat belts is Air Associates Model M-7500, custom-made of full-bodied, nylon-rayon. Woven for maximum grippage, it provides improved behavior characteristics as well as longer life and increased attractiveness. Webbing is available in six standard colors: dark blue, dark green, beige, gray, tan and black. (Specials on request.) New satin-chrome buckle is designed with disc cut-out for airline insignia. M-7500 meets CAA specification TSO-C22B.

Write for Air Associates Seat Belt Catalog 22 for complete information on the M-7500.

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Teterboro, New Jersey

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ARGENTINE AIRLINES
BRANIFF AIRWAYS
BRITISH GUIANA AIRWAYS (Govt.)
BRITISH OVERSEAS AIRWAYS CORPORATION B·O·A·C
BRITISH WEST INDIAN AIRWAYS
CALIFORNIA EASTERN AVIATION, INC.
Capital Airlines
COMPANIA DE AVIACION "FAUCETT", S.A.
CENTRAL AIRLINES Inc.
CENTRAL AFRICAN AIRWAYS CORPORATION
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PIEDMONT Airlines
RIDDLE airlines inc.
TRANS-TEXAS Airways
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LAN LINEA AEREA NACIONAL • CHILE
The Flying Tiger Line Inc.
NORTH AMERICAN AIRLINES
NORTH CENTRAL AIRLINES INC.
PACIFIC NORTHERN AIRLINES, INC.
SOUTH AFRICAN AIRWAYS
SLICK airways inc.
SOUTHWEST AIRWAYS COMPANY
TAN airlines
TRANSPORTES AEREOS NACIONALES, S. A.
WCA WEST COAST AIRLINES
TATA Incorporated

People

MANUFACTURING

F. S. Gais named chief reliability engineer of McDonnell Aircraft Corp.'s missile engineering division, reliability dept.

James J. Ward named asst. mgr. and Charles A. Kerner, chief engineer, Northrop Aircraft, Inc.'s Anaheim division.

Arthur E. Hafstad named administration mgr., Lockheed Aircraft Service-International, succeeding **Walter J. Currie**, new Washington rep. of LASI.

Lawrence R. Steinhardt elected president of Narmco Metlbond Co.

William M. Duke, former vp of Cornell Aeronautical Research Lab, made program director of the Titan ICBM program.

C. O. Osthoff named adm. asst. to exec. vp and gen. mgr., Aerodex, Inc.

Clifford E. Burt elected vp and controller and **Gifford K. Johnson** elected vp-production, Chance Vought Aircraft, Inc.

Robert G. Swan, Jr., appointed exec. dir. of Work Saving International's aviation division.

Kenith G. Strunk appointed adm. dir. of engineering of Breeze Corporations, Inc.

Foster

Willcox

William C. Foster elected chm. of the board of Reaction Motors, Inc.

Philip M. Willcox elected vp-administration of Lockheed Aircraft Service; **Dr. Samuel B. Batdorf** named asst. director and head of electronics division, Lockheed missile systems division.

Lou Helmuth made asst. sales mgr. in charge of administration and **Murray Berkow**, director of sales engineering, Republic Aviation Corp.

William B. Main appointed aircraft service mgr.-western region, Vickers Inc.

Maj. Gen. Raymond C. Maude, former commander of ARDC Cambridge Research Center, joins Allen B. Du Mont Laboratories, Inc.

J. E. "Bill" Harling made operations mgr. for Pasadena and Los Angeles facilities of Air Logistics Corp.

R. Lynn Eslinger appointed military contracts mgr. of LearCal division, Lear, Inc.; **Henry J. Hamm**, commercial and international sales mgr., resigned to enter private practice; **Lazare Gelin** resigned presidency of Lear International to become independent consultant.

James T. Dresher appointed treas. of Hiller Helicopters.

Dr. Hang C. Lin named senior engineer in charge of CBS Semiconductor Applications Laboratory.

Robert C. Conant appointed mfg. mgr. of Jackson division, Aeroquip Corp.

Robert J. Lang made asst. to pres. of Aircraft Engineering & Maintenance Co.

Robert E. Pollock elected treas. of Carmody Corp.

Marvin B. Ruffin named vp-gen. mgr. of Summers Gyroscope Co.

Greer Hydraulics announces the following appointments: **T. Lawrence Cronin, Jr.**, director of industrial relations; **Robert P. Vartan**, controller; **Cecil Barlow**, mfg. superintendent; **Melvin Schoenberg**, planning supervisor.

AIRLINE

Henry T. Harrison appointed director of meteorology for United Air Lines; **Robert W. Erdmann** named mgr. of traffic administration.

Harrison

J. J. Grundwald appointed adv. mgr. in North America for Lufthansa German Airlines.

Miguel Pombo will head Avianca's passenger and freight operations in the U.S.

J. M. Ferris appointed asst. sales mgr. for Canadian Pacific Airlines.

George A. Boughton named regional sales mgr. (the Americas) for British Overseas Airways Corp.; **Labib Majdalani** appointed sales mgr., USA.

James Di Stefano made special cargo sales representative for Braniff International Airways' eastern region.

Delta Air Lines announces the following changes in personnel: **Louise Ellis**, stewardess supervisor, from Dallas to Atlanta; **Rosemarie Acker** to stewardess supervisor, Dallas; **Marianna DeLashmutt**, stewardess supervisor, from Chicago to Houston; **Mary Ann (Pinky) Smith** to stewardess supervisor, Chicago; **Sue Wincher** to asst. supervisor, Atlanta.

Earl Raymond succeeds **Earl Wageneck** (resigned) as mgr. of maintenance for Capital Airlines; **Paul B. Humphreys** named asst. maintenance mgr.; **Harold M. Ingalls**, supt. of maintenance and overhaul; **R. W. Bauer**, supervisor of powerplant overhaul.

A. E. Hagberg elected vp-traffic for Wien Alaska Airlines.

George A. Warde appointed prod. mgr. of California Eastern Aviation, Inc.'s airways division.

GOVERNMENT

S. F. Follett succeeds **S. Scott Hall** as head of the Ministry of Supply staff in the British Joint Services Mission in Washington.

HONORS

Col. Horace A. Hanes, dir. of flight test at Edwards AFB, awarded Mackay Trophy for most meritorious flight in 1955, setting the world's first official supersonic speed record of 822.135 mph; he also received the Thompson Trophy for record runs at an altitude of 40,000 feet.

Harry F. Vickers, president of the Sperry Rand Corp., will receive the American Society of Mechanical Engineers medal for "distinguished service in engineering and science" this year.

HONOR ROLL

(For 25 years' or more service in the industry.)

★**H. M. Horner**, United Aircraft Corp. Chr. of bd., E. Hartford, Conn. (30 yrs.).

Raymond R. Smith, Pratt & Whitney Aircraft. Spare parts sales, E. Hartford, Conn.

Bernard Dutton, Pratt & Whitney Aircraft. General Foreman, D-954, E. Hartford, Conn.

C. L. Looper, American Airlines. Inspector, Los Angeles.

R. L. Campbell, American Airlines. Buyer, Tulsa.

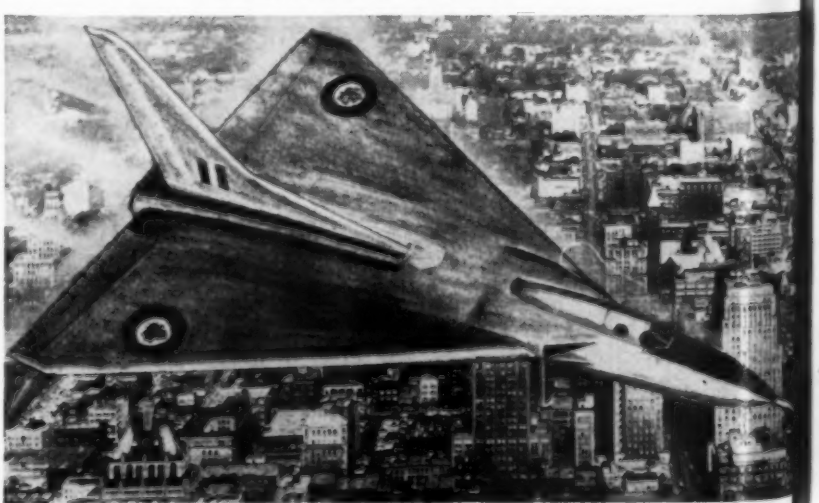
E. M. Carson, American Airlines. Pilot, Los Angeles.

★**G. B. Grogan**, United Air Lines. Station ground services mgr., Monterey. (30 yrs.)

L. C. Allen, United Air Lines. Shop mechanic, San Francisco.

How Canada's New CF-105 Fighter Will Look

This is first release of an artist's conception of Avro Aircraft Ltd.'s new CF-105 supersonic delta fighter. Photo accompanied an announcement from Garrett Corp. that its AiResearch division built the jet's cockpit cooling unit. Production CF-105s will be powered by Orenda Engines' new 20,000-lbs.-thrust Iroquois turbojets. Prototype will have a pair of U.S. jets, probably Pratt & Whitney J57s.



Capital Airlines Says Viscounts Break Even At 56.8% Load Factor

And Company States Turbo-Prop Aircraft Head for 53% to 55%, Lower Than Piston Planes

By a WALL STREET JOURNAL *Staff Reporter*

NEW YORK—The turbo-prop Viscount air-
liner, introduced by Capital Airlines last sum-
[illegible] to break-even with a load

⇦ ONE OF MANY REASONS WHY CAPITAL AIRLINES IS BUYING 15 MORE VISCOUNTS

According to J. H. Carmichael, Capital Airlines' President, the Company's decision to add 15 new Viscounts to its fleet is based on the "splendid public acceptance accorded the Viscounts and their outstanding operational performance in scheduled air transportation."

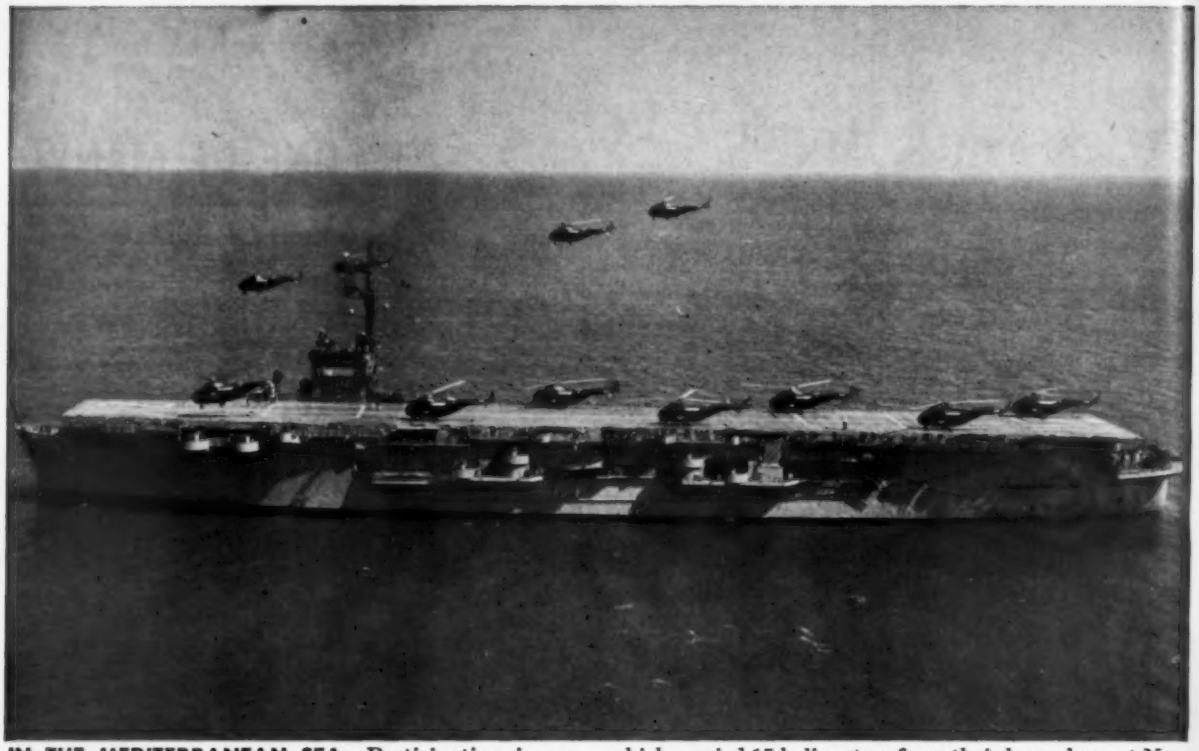
The Viscount, powered by four Rolls-Royce Dart engines for whisper-quiet and vibrationless flight, is the first and still the only turbo-prop aircraft in airline service in the world.
United States Representative: Christopher Clarkson, 10 Rockefeller Plaza, New York 20, New York

turbo-prop VICKERS VISCOUNT

POWERED BY FOUR ROLLS-ROYCE DART ENGINES

VICKERS-ARMSTRONGS (AIRCRAFT) LTD., WEYBRIDGE, ENGLAND • MEMBER COMPANY OF THE VICKERS GROUP

Circle No. 23 on Reader Service Card.



IN THE MEDITERRANEAN SEA—Participating in amphibious exercises of the U. S. Navy in the Mediterranean area are Sikorsky HRS helicopters of the Marine Corps. They are shown above with the escort carrier *Siboney*, which carried 15 helicopters from their home base at New River, North Carolina. The training exercises featured helicopter vertical envelopment tactics.

AROUND THE WORLD WITH SIKORSKY HELICOPTERS

SAVED—A DANISH SEAMAN—A Sikorsky HO4S helicopter from the U. S. Coast Guard Station at Salem, Mass., takes a Danish sailor from the merchant ship *Paula Dan* 25 miles off Block Island. The sailor, stricken with acute appendicitis, was lifted in the basket visible below the helicopter and was flown to a hospital ashore for surgery.

SAVED—A U. S. COASTGUARDSMAN—Two days later the same HO4S helicopter picked up a U. S. Coastguardsman from the Nantucket Lightship. Also a victim of acute appendicitis, the man was quickly and safely taken to the same shore hospital. Helicopters have rescued more than 10,000 people in all parts of the world.

LARGER S-58s FOR NEW YORK AIRWAYS—The first of a new fleet of 12-passenger Sikorsky S-58s has been delivered to New York Airways, the helicopter airline serving Greater New York and nearby communities in three states. Sabena Belgian World Airlines has ordered eight for its European helicopter service. Both lines currently use Sikorsky S-55s. The S-58s will be the largest helicopters to be in regular airline service anywhere in the world.

HELICOPTER HISTORY

FIRST SCHEDULED HELICOPTER SERVICE

On October 1, 1947, the world's first scheduled helicopter service was started by Los Angeles Airways, carrying air mail. One of the line's original Sikorsky S-51s, above, is still operating and has flown 10,000 hours. Los Angeles Airways was a pioneer in night operation and instrument flying, and carried over 10 million pounds of air mail in its first three years. The line now carries passengers as well as mail and express in its fleet of Sikorsky S-55s.

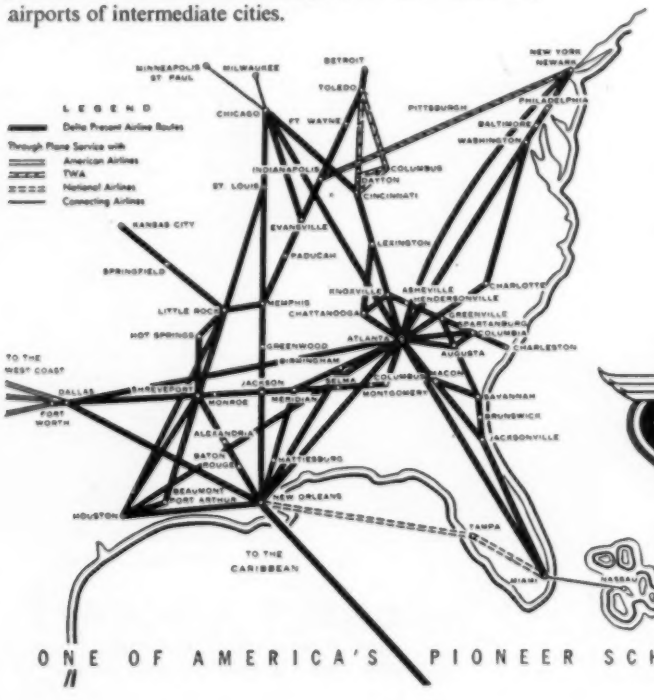
SIKORSKY AIRCRAFT
BRIDGEPORT, CONNECTICUT
One of the Divisions of United Aircraft Corporation

FIRSTS *come naturally with* DELTA . . .

with a record of pioneering DC-7 service throughout the South, Delta is now preparing to assert continued leadership with orders for more than $110,000,000 in new equipment. New Super Convair 440 Metropolitans and 10 more DC-7's will be available for additional service in 1956 and 1957.

Douglas DC-8 jets will link major Southern cities with the East and Midwest in the fall of 1959—6 months ahead of any other carrier.

Early in 1960 Delta will take delivery of the first Convair jetliners for short-to-medium range operation from existing airports of intermediate cities.



Other Delta firsts:

1. First four-engine service, Chicago-Miami.
2. First non-stop service, Chicago-Miami.
3. First to file for coach service, Midwest to Florida.
4. First airline to offer packaged summer vacations to Miami and the Caribbean.
5. First DC-7 service to and through the South.
6. World's first intercontinental DC-7 service.
7. First ranking carrier in proportion of DC-7 service to total seat-mile capacity.
8. First day and night coach services across the South.
9. First scheduled jetliner deliveries for service to and through the South.

Delta AIR LINES

General Offices, Atlanta, Georgia

ONE OF AMERICA'S PIONEER SCHEDULED AIRLINES

West Coast Talk . . . By Fred S. Hunter

• Big AF evaluation team studying supersonic chemical bomber program.

LOOKS AS THOUGH the Air Force might decide what it should do about its proposed supersonic chemical bomber program, the WS-110A, before long now. It had a big evaluation team—about 50 in number—at Seattle recently scrutinizing Boeing's blueprints, and later the group flew down to Los Angeles to see what North American had to offer. Powerplant selection will be a real major item if the Air Force decides to continue the project. Engines are still on paper but they will be turbojet of a new, very advanced type. General Electric and Pratt & Whitney are supposed to be in the forefront in this department.

Hunter

• •

Things are getting tough all over. Cafeteria at Lockheed's Missile Systems division has upped the price of chocolate sundaes to 12¢.

• •

Latest jet transport development is a new C-6 rating P&W is offering for the J57 engine by increasing the water flow for higher takeoff thrust. Purpose is to squeeze out more payload. Amount of water that would have to be carried by either a Boeing 707 or Douglas DC-8 using J57 power is 5,800 pounds. That's a lot of water, but it would up the J57 thrust to close to 13,000 pounds, which seems to be about what is needed to get out of Idlewild for the coast on a hot day without leaving part of the load behind. There's a joker in it for the manufacturer, though. It's up to him to devise a method for heating the water for cool days.

• •

Gayest-looking airline ticket office in the country is American Airlines' new office at Hollywood and Vine. As a matter of fact it's also the gayest-looking spot on Hollywood Blvd.

• •

Site of the plant Douglas is now building at Long Beach for its DC-8 jet transport comprises 82 acres. Big airplane, big plant. The final assembly building itself will have 1,500,000 sq. ft. of floor space. The DC-8 facility, incidentally, will be completely detached from the Long Beach division's present military production facilities. Factory personnel will draw Long Beach division pay checks, which means the CIO-AFL Auto Workers will be the bargaining agency, but in other respects the Long Beach DC-8 plant will be the Santa Monica division's baby.

• •

A set of Aeroproducts propellers for the Lockheed Electra comes to $90,625.

• •

Homer Rhoads, president of Hydro-Aire, has generated quite an air of excitement among his employes with what you might call the Great Fuel Pump Sweepstakes. Some lucky employe will win a $500 savings bond for holding the number closest to the time a new booster and transfer pump comes to a stop in a test to destruction. This is no lottery. Hydro-Aire distributed the numbers to employes for free. Idea is to give the esprit de corps around the place a shot in the arm by getting all of the company's 750 employes interested in the development of an important new product, not just the handful directly associated with it. No matter how the pump comes out in this one test, Rhoads figures it a major step in company-employe relations. As this was written, the pump seemed to be doing all right, too. It had clocked off 700 hours without a murmur. The goal is 1,200.

• •

New Douglas XF5D for the Navy has a P&W J57-P8 engine, but production models will have improved P14 model . . . Hughes Tool's projected new helicopter is the Model 269 . . . Douglas is completing the paperwork for an increase in the maximum gross takeoff weight of the DC-7C from 141,750 to 143,000 pounds . . . Pacific Airmotive Corp. bought two Cessna 182s to use in demonstrating the new Federal autopilot which it will distribute in 16 western states . . . Los Angeles Airways is up to 14 passenger stops as compared to 30 mail stops . . . Navy is now operating five turboprop Convair Tradewinds between Alameda and Honolulu.

Is Business Flying Still in Its Infancy?

By LOIS C. PHILMUS

Business flying has consistently and effectively created new business for the aircraft industry over the past few years. It is confidently predicted to have the greatest growth potential over the "older" forms of air transportation, with the surface barely touched.

Where into this scheme does the new lightplane manufacturer fit? Beech, Cessna, Piper and Aero Design are making and breaking new delivery records every month. Backlogs are being consistently stretched. Production, now at an all-time high, is still not keeping abreast with demand. Distributors are selling every aircraft—new and old—that is airworthy and that is available. And still the demand grows.

Quietly, doggedly and effectively more than a dozen new manufacturers are jockeying for position—not to "capture" the market—but to share in an industry that for all intents and purposes has just started.

• An AMERICAN AVIATION survey of of "new" industry has found the underlying philosophy of the small manufacturers to be a far cry from the "boom-and-bust" days of 1946 and 1947. The common denominator is coupled with confidence in the product—in most cases created by experienced hands—and determination to succeed despite the tremendous financial obstacles thrown up before them.

The seven new manufacturers responding to the questions posed by the survey have for the most part much in common.

The companies have in various stages of development and production a diverse line of business and personal aircraft ranging from utility two-place designs to multi-engine 10-place amphibians and jets.

• **Standing between** the new firms and potential customers for their new airplanes is the high wall of financing. Generally, the new designers have had relatively little difficulty in obtaining the limited funds necessary for development work. But when it comes to raising a hefty $500,000 for tooling and production facilities to put the accepted product on the hungry market, a heart-breaking block is raised.

The principals of the new companies, for the most part, are determined to retain control of the aircraft and firm which they have struggled so hard to create. While small public sales of stocks have brought in some revenue, it is not nearly enough.

Financing "is the greatest hindrance to all the small aircraft manufacturers," P. H. Bruns, president of the Baumann Aircraft Corp., has asserted. "We have not wanted to give control of our company to an outside group after our own people have put many, many years of unstinted labor into it."

BAUMANN BRIGADIER

COLONIAL SKIMMER

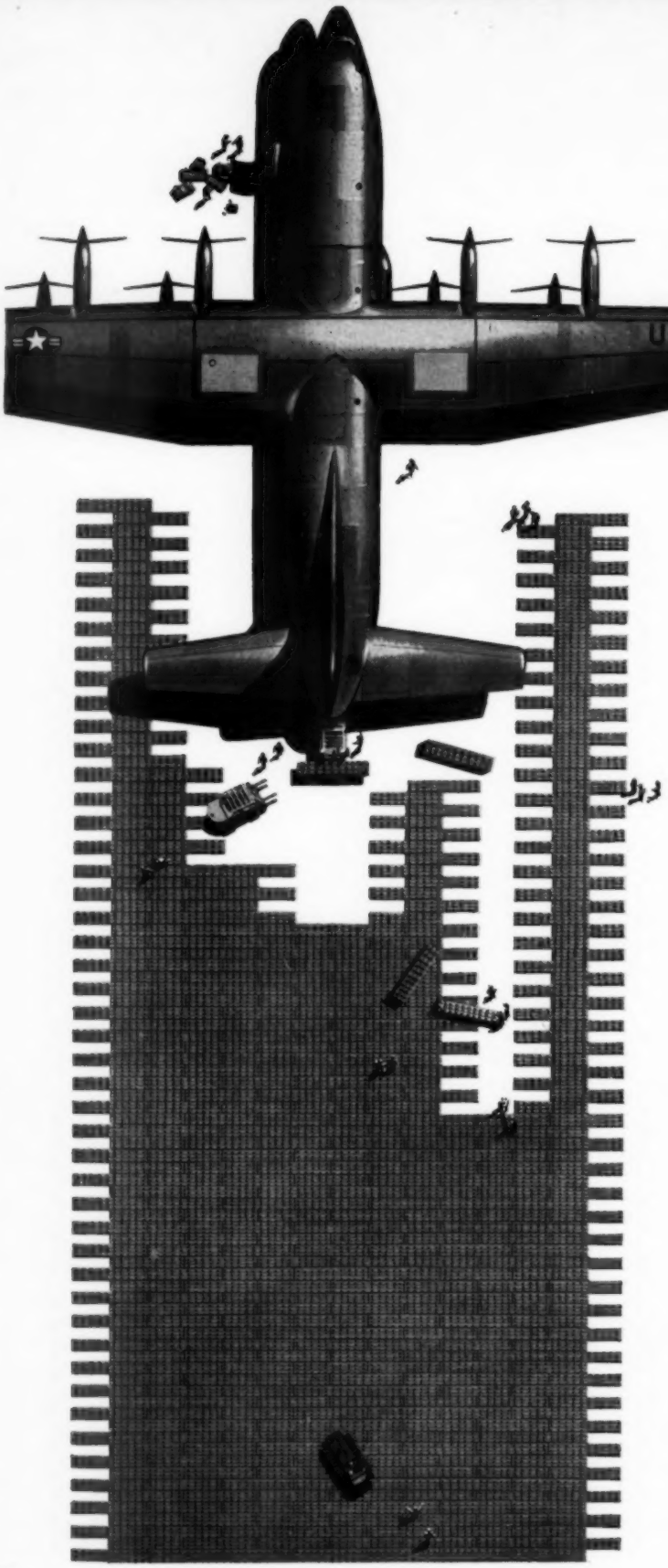
MORRISEY NIFTY

• **Is there even a partial answer?** The companies have raised some money through small stock sales, but are attempting to finance their own airframe production through earnings. The earnings come from subcontracting from the aircraft, electronics, plastics and allied industries.

Receipts from subcontracting are inherited by the airframe portion of this business. Does this philosophy work? Some of the companies farther advanced and in actual production are proving it does:

• **Taylorcraft, Inc. of Conway, Penna.,** which is on a two-plane-per-week schedule of its four-place fiberglas Ranch Wagon and fiberglas Topper Airplane, has delivered about 30 airplanes to date. Production is expected to be stepped up to a one-a-day basis.

Financed through private and public funds, Taylorcraft is largely engaged in the production of parts and assemblies for other aircraft and helicopter manufacturers, as well as servicing parts



SPECIFICATIONS:
Speed, 357 mph; range, 2,500 nautical miles; payload, 25,800 pounds; takeoff distance, 2,000 feet; landing distance, 1,320 feet.
Fully pressurized. Powered by 4 Allison propjets.

LOCKHEED HERCULES

USAF C-130

CAN CARRY AN AIRSTRIP WHEREVER HE GOES

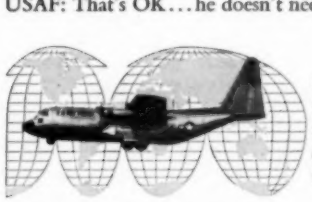
Airhead? Needed fast? Call in 18th Air Force's (Tactical Air Command) new C-130 Hercules, built by Lockheed for cargo and personnel, endowed with 20-ton lift-capacity and jet-age speed.

Hercules works fast: The paratroopers he dropped have the area under control. Century series fighters, like Lockheed's F-104, have control of the air situation. Next job is to bring in the engineers together with their material and machines to build the strip. As it takes shape, the propjet giant shuttles between base and advanced strip, maintaining flexible supply lines—handling orders for more material quickly and efficiently.

Before long the strip is humming. Fighters roar in and out. Repair, communications, logistics... all the myriad military operations are in high gear.

Hercules' job is just beginning. The medics want fast transport back to base hospital for the injured. Paratroopers are dropped to take a key hill. Food, ammunition, heavy weapons are ready to be dropped in widely-scattered areas.

There's little rest for this "strongman" of the USAF: That's OK... he doesn't need much.



NOW IN QUANTITY PRODUCTION AT USAF PLANT NO. 6.

LOCKHEED
AIRCRAFT CORPORATION
Georgia Division, Marietta, Georgia

Look to Lockheed for Leadership

for earlier Taylorcraft models. Its present plant provides 50,000 sq. ft. of floor space at the local airport. B. J. Mauro, president, says the company is presently negotiating for additional plant sites in order to expand production.

• **Helio Corporation** last month announced the purchase of the plant and organization of the Mid-States Manufacturing Co. in Pittsburgh, Kans., where its Helio Courier had been in production under lease arrangements. In acquiring the company, Helio, which already has sold $750,000 worth of its aircraft, not only got its own airframe production facilities, but considerably expanded its capacity for subcontracting work.

The million-dollar transaction (partially paid for with Helio common stock) involved the acquisition of Mid-States sub-contracting division which is expected to produce close to a million dollars in aircraft component work. It further is expanding its output of electronic components at its headquarters plant in Norwood, Mass.

The basic economic concepts of the companies are firmly established: subcontracting work to pay the bills; stock sales within control for further help. But still more push is needed to get the sorely needed aircraft on the market. Mergers are not felt to be the answer.

Taylorcraft's Mauro does not believe this "will be the common thing, since the general purpose of merger is usually to expand facilities or add additional lines." However, he points up, and is supported also by Helio's action, "we have merged other non-competitive companies into our own organization in order to give us additional diversifying facilities."

• **Another view** of mergers was expressed by Baumann Aircraft's Bruns: "We feel that mergers could in many instances be profitable for the small companies." Or, if not mergers, a combining of "energy and enterprise for research, engineering and production that will improve the lot of all the participants."

Bruns invites all small airframe manufacturers to "convene a congress . . . to start what might be a valuable clearing house of material, methods, engineering data, development and research, standardization of time-tested and proven parts and procedures, which would help the small airplane-builder, and thus cut down the overhead bugaboo appreciably." He added that "having a consolidated research and engineering staff alone could save hundreds of thousands of dollars annually for us all."

Perhaps just such a move would in itself restore the confidence of investors in the lightplane industry. With guaranteed income from subconstracting work, investors have little to lose and much to gain. The budding industry is unique: In a world where commercial transport development has been largely dependent on "military subsidy," a new struggling group is producing pure civil products "out of pocket."

Here's a rundown on some of the individual companies, their status, their plans and their thinking:

• **Baumann Aircraft Corp.** of No. Hollywood, Calif., has five Brigadier Model B-290s in various stages production, with the first production model now being test flown for final certification tests. It is an all-metal, twin-engine five-place pusher type, scheduled to sell for $44,970. Production schedule being laid out calls for completion of one aircraft per week in ten months, to be doubled in 20 months.

Transition to a Super-Brigadier Model B-480 from the smaller model is already planned over a five-to-seven-year period. On its drawing boards are designs for an eight-place 800 hp amphibian to market for $125,000 and a twin-engine 1300 hp 10-place pressurized transport to retail for $295,000.

Guiding hand has been J. B. Baumann, chief consulting engineer and chairman, with P. H. Bruns as president and general manager; H. F. Brown, secretary-treasurer, and J. S. Kenny, chief pilot. The company has been financed through stock sales "to a small extent" and through sub-contract work to "a rather large extent."

The company has continuing contracts from three large aircraft companies and an electrical manufacturer and has developed two proprietary items of its own—a high-pressure throttling device for handling liquid oxygen and various corrosive fluids; and a new type valve still in development. The Brigadier has "been largely supported by doing the other items at a profit."

Beech's Newest Twin-Engine Aircraft

Beech Aircraft Corp. recently "unwrapped" its fourth executive aircraft type, the Beechcraft Model 95 Badger, a four-place twin-engine airplane designed for the $35,000-$55,000 price market. First flight was made earlier in the month. An accelerated flight-service test program is under way to assure early 1957 deliveries. The Badger is powered by two 180 hp Lycoming engines and will cruise at about 200 mph.

• **Bee Aviation Associates** of San Diego is readying final designs for its Queen Bee single 150 hp engine four-place all-metal small executive aircraft. The principals of the corporation have been together since 1948 and are engineers in the San Diego area, who have resurrected the old pioneer spirit of the early aviation days by working nights and weekends in their garages. They are: Bill Chana, president, supervisor of in-service enginering for Convair; Ken Coward, vice president, preliminary design engineer for Ryan Aeronautical; Walt Mooney, secretary, a pre-design engineer for Convair. Treasurer is Jim Bowie, a San Diego accountant.

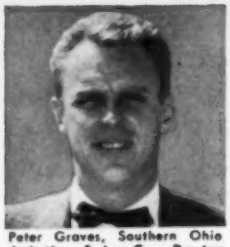
The Queen Bee has resulted from an evolution, which began in 1948 with the Wee Bee "built just for fun" in off hours. This progressed to the two-place Honey Bee which the officers certificated themselves. Having just sold $30,000 worth of stock, the company is now proceeding to produce three of the Queen Bees. It will be low-wing, metal and fiberglas, four-place aircraft which will be geared to sell between $9,000 and $10,000.

The three aircraft will be built in leased facilities. On completion, arrangements will be made with a distributor to provide a nationwide demonstration to determine market acceptance. From there the problem of raising $500,000 will be tackled to proceed with full scale production. Supplemental income? Sub-contracting with a small R&D research contract expected from the Army for a VTOL.

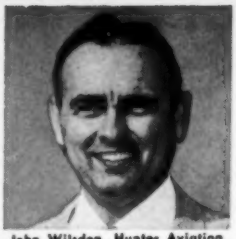
• **Colonial Aircraft Corp.** of San-

Don Vest, Vest Aircraft & Finance Co., P O. Box 5306, Sky Ranch Airport, Denver, Colorado.

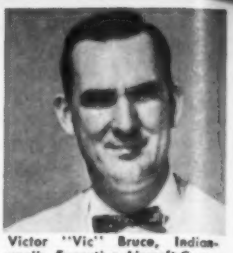
Gene Hudman, Stonnell and Holladay Aircraft Sales, Carolina Division, Municipal Airport, Charlotte, North Carolina.



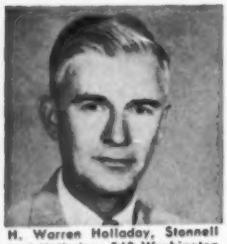
Peter Graves, Southern Ohio Aviation Sales Co., Dayton Municipal Airport, Vandalia, Ohio.



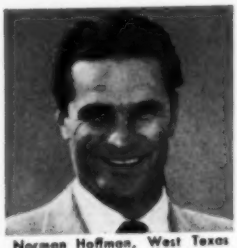
John Wilsdon, Hunter Aviation Co., P O. Box 122 Lambert Field, St Louis, Missouri.



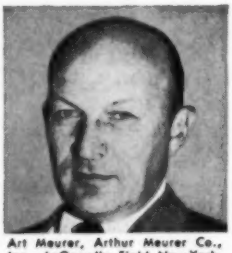
Victor "Vic" Bruce, Indianapolis Executive Aircraft Corp., Indianapolis Municipal Airport, Indianapolis, Indiana.



H. Warren Holladay, Stonnell and Holladay, 843 Washington Building, Arlington Towers, Arlington, Virginia.

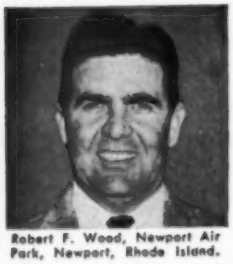


Norman Hoffman, West Texas Flying Service, Midland Airport, Box 82, Midland, Texas.



Art Maurer, Arthur Maurer Co., Inc., LaGuardia Field, New York, N. Y.

John S. Brown, Brown Aero Corp., 3300 Love Field Drive, Dallas, Texas.



Robert F. Wood, Newport Air Park, Newport, Rhode Island.

Wynn Cronin Minnesota Air motive Inc Minneapolis-St. Paul International Airport, Minneapolis Minnesota

A. M. "Sima" Bertolet, Reading Aviation Service, Inc., Municipal Airport, Reading, Pennsylvania.

H. Leibee Wheeler, Buffalo Aeronautical Corporation, Buffalo Municipal Airport, Buffalo, New York.

Max R. Brand, Aero Commander Dist. (Downtown Airpark), Hangar 3, Municipal Airport, Tulsa, Oklahoma.

E. H. "Ted" Talen, National Aero Sales Corp., Midway Airport, Chicago, Illinois.

W. D. Maddox, Aero Southern Corp., 601 North Broadway, Nashville, Tennessee.

W. H. "Bill" Buchanan, Sales Manager, Johnson Air Interests, Inc., Horlick-Racine Airport, Racine, Wisconsin.

Louis Humphreville, Executive Aircraft Corporation, Municipal Airport, Pontiac, Michigan.

W. B. Carrell, Chamberlain Aviation, Inc., Akron Municipal Airport, Akron, Ohio.

John A. "Jack" Bauman, Santa Monica Aviation, 3011 Airport Avenue, Municipal Airport, Santa Monica, California.

Herrol Bellamy, L. B. Smith Aircraft Corp., Miami International Airport, Miami, Florida.

Lucien M. Taillac, Trans-Aire Corporation, Pan-Air Building, New Orleans Airport, New Orleans, Louisiana.

Joseph H Frost, Jr.

Robert M Brown

Commander Sales Company, Terminal Building, International Airport, San Antonio, Texas

ford, Me., has just delivered its first three Model C-1 Skimmer amphibians, and President David Thurston reports that the entire production of 20 planes for the year are earmarked for delivery. Type-certificated last Fall, the Skimmer was designed by the company officers.

Following a successful stock offering, Colonial was put into operation last December, with its entire effort to date devoted to tooling and production of the amphibian. However, Thurston has revealed, we are "now actively seeking contract work of a major and prime nature in both the military and commercial fileds."

Now that the Skimmer is launched, the company is planning development into more advanced models. "Considerable growth potential exists in the basic design," Thurston declared. "We anticipate no difficulty from competition with the larger manufacturers inasmuch as none of them has a small amphibian in production." Priced at $15,750, the Skimmer is powered by a Lycoming 150 hp engine and cruises at 123 mph.

Colonial has franchized distributors for fairly large territories. In addition to the present setup (AMERICAN AVIATION, July 30,) negotiations are under way for new distributorships in California, Pacific Northwest, Ohio area, Southeastern U.S. and the Chesapeake Bay area, as well as Switzerland and Rome.

Colonial owns outright 53,000 sq. ft. of manufacturing space including final assembly and flight test facilities at Sanford Airport. It has an option on an additional 50,000 sq. ft. of final assembly area.

"While we do not expect to become a General Motors of the aircraft field overnight," Thurston said, "it is this company's feeling that executive flying is in its mere infancy at the present time. While the airplane will never experience such production as the automobile . . . there is no doubt that as men who realized the utility of the airplane during the last war attain business positions such that they can influence their company's operations, more and more aircraft will be sold as a business asset from both a prestige and utility standpoint."

• **Florida Flight Engineering Corp.** of Miami was conceived and financed by a group of Eastern Air Lines personnel. A stock prospectus is presently being circulated to raise much needed capital of about $250,000. "Our future can be unlimited if our financing becomes adequate and our original plans in the aviation venture can be pursued," H. D. Coonley, president, declared. "As it is, we will continue making commercial products until the aviation division can be fully developed."

FFE has three aircraft in design and development stage. One is a completed prototype of a single place jet aircraft—completed that is except for the engine. "The major problem," Coonley points out, "has been lack of cooperation with the engine manufacturer for providing an engine at a reasonable cost. Present prices prohibit a small manufacturer from feeling safe to proceed with the project."

The single-place jet, it is pointed out, can be converted to a two-place job and can be adapted to a remote control drone target or reconnaissance aircraft.

The second plane in design stage is a two-place lightplane to be powered with a low horsepower reciprocating engine. It is to be of molded reinforced plastic, designed to sell for about $2,000.

The third is a more complex program, to develop a 6-to-8-place pressurized corporation transport powered by two Fairchild J44 1,000-lb. thrust engines which would cruise at 350 mph. Production (financing willing) will get started as soon as prototypes have been flight tested successfully.

Finding that the "public has little interest in the stock," the newborn company is manufacturing commercial products of reinforced plastics in a 16,000-sq.-ft. plant near Miami International airport.

• **Morrisey Aviation, Inc.** of Santa Ana, Calif. is starting on production of five pilot models of a two-place, all-metal, all-round utility aircraft. Following a nation-wide tour with the prototype, William J. Morrisey, designer and retired chief test pilot of Douglas' Long Beach division, is now attempting to obtain financing. He returned from the tour with letters of intent for about $800,000 worth of orders.

Designated the Model 2000 Nifty, the Morrisey aircraft is powered with a 115-hp Lycoming engine and priced at $5800. Biggest market, Morrisey feels, will be among buyers seeking a personal plane with particular appeal to fixed base operators and flight instructors. The tandem-seat Nifty was designed as a trainer, as well as for personal use. Adaptation to agricultural purposes is easily obtained by installation of a hopper. Expansion to a four-place configuration is built in.

• **Royal Aircraft Corp.** is a unique case in the new light-plane manufacturing picture. The corporation was formed as a wholly-owned subsidiary of the Kearney & Trecker Corp. of Milwaukee which precluded any financial difficulties. The company was formed to assemble and distribute the Italian Piaggio amphibian under the Royal Gull label. The only light twin-engine amphibian now available, 12 Royal Gulls have been delivered to date and three per month will be delivered the remainder of the year.

Piaggio delivers the airframe torn down to the Mitchell Field plant, where the company assembles the aircraft with American engines and components. The subsidiary has set up distributorships in the U.S., Canada, Alaska and Mexico as well as the Caribbean.

Late this month, prototype of a supercharged version of the Royal Gull will be delivered from Italy, following certification tests.

Despite the trials and tribulations, we predict that the new companies reported above and others yet to come will be added to the ever-growing general aviation industry. ◊ ◊ ◊

NAA Shelves Plans For Executive Aircraft

North American Aviation has definitely decided to shelve purported plans for a turboprop executive aircraft for the "foreseeable future." Earlier in the summer, it had been reported that NAA would make a decision about this time on whether or not to proceed with the project. Decision was to be determined by military contracts received during the period.

Another contributing factor has been NAA's reluctance to get involved with a commercial aircraft because of its past experience with the Navion. The project, which had advanced only as far as a mockup, has been rumored and discussed for about two years. The official word from J. L. Atwood, president, is definite:

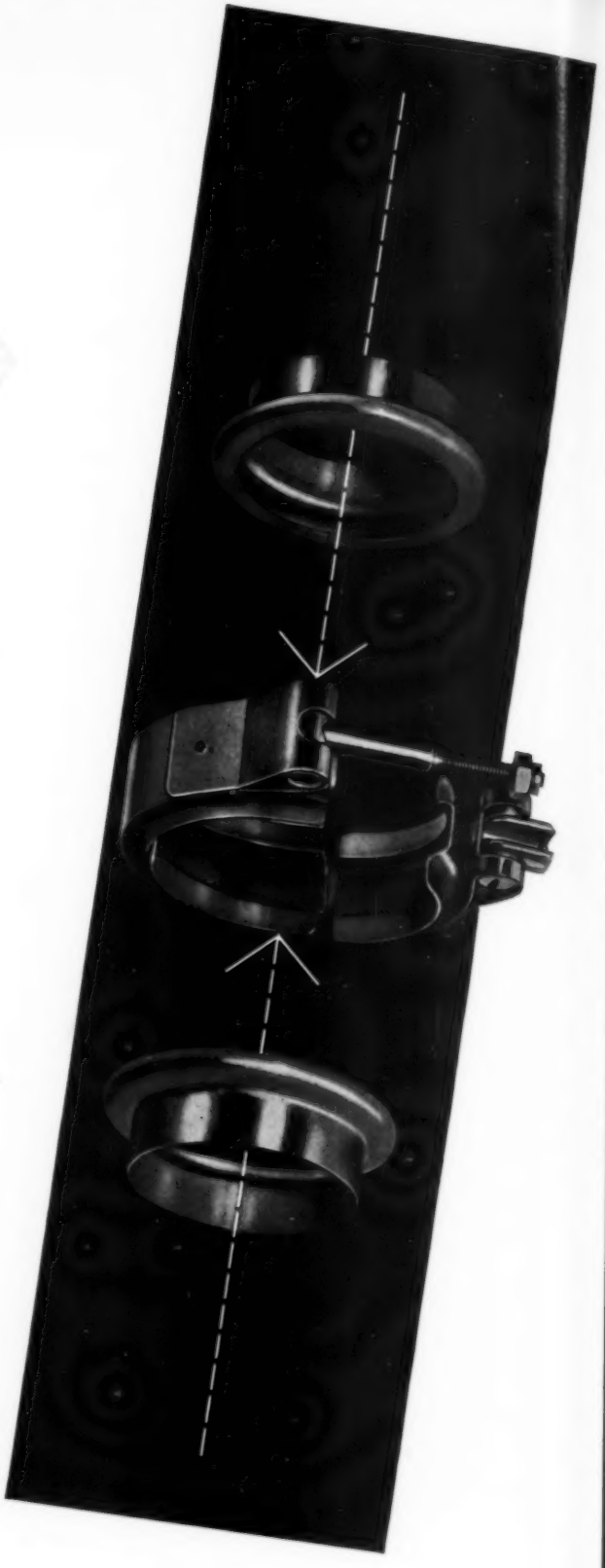
"We have no plans at this time to proceed with the design of an airplane for this particular field. We have considered this market on several occasions, but in view of existing conditions have proceeded no further than that stage."

Lear Plans Network Of Service Stations

Lear, Inc, has announced a new program for creating a network of about 100 CAA-certified radio service stations in the U.S. More than 25 Lear distributors' radio shops have already been certified.

A distributor, in order to qualify, first must have his repair facility approved and all radio technicians must hold CAA certificates covering each class of equipment to be serviced. Then, following inspection by a Lear factory service representative, the distributor is granted final certification when all prescribed procedures and test equipment are found to comply with factory requirements.

What's special about these couplings?



Look at the newest couplings for jet aircraft bleed air ductwork! Connect them, disconnect them—again and again—they remain tight and dependable. Trouble-free performance is a result of metal to metal seal, with no secondary sealing devices or compounds. No loose parts to get lost or damaged.

Janitrol couplings save up to 40% in weight over conventional designs, yet they're designed for continuous use at 250 psi at 750°F. To make installation easy, clamp tightens on latching side; quick connects and disconnects can be made in hard-to-reach locations! Lock nut torque is only 35 in. lbs.

They withstand corrosion, pressures, temperatures, surges, misalignment, and vibration. Maximum design leakage is .01 cfm per inch of duct diameter.

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NOVEMBER ELECTION HOLDS THE KEY to CAB vice chairman Joseph P. Adams' future with Board. Republican Presidential victory probably would mean the end of Adams' CAB career this December.

But Democratic victory not only could result in another six-year term for the Washington Democrat, but 1957 Board chairmanship as well. Also important to Adams' future is campaign for re-election this year of Sen. Warren D. Magnuson (D-Wash.), his staunchest Congressional supporter.

●

AVIATION, AND CAB IN PARTICULAR, may be very much in the news this fall. Reason: Senate hearings into activities of Murray Chotiner, former campaign manager for vice president Richard M. Nixon apparently were held back pending outcome of Republican convention.

Main area of scrutiny is Chotiner's representation of Trans American Airlines and Southwest Airways in CAB matters. Senate group headed by Sen. McClellan (D-Ark.) has been investigating to what extent, if any, Chotiner used his former Nixon connection to aid his clients.

And file is growing. Named so far are many CAB officials and some top White House personnel other than Nixon.

●

LOOK FOR A STIFF FIGHT by CAB staff and some Board members next year against any move by Congress to revamp local service airline subsidy policy. Board stand is that absence of profits for feeders can be traced directly to disallowances in mail rate cases —which they interpret to mean "inefficient management."

Inherent in CAB group's position is feeling that additional revenue for locals should come from trunks, not the U. S. treasury. Probable result: stepped-up activity in new route cases for local lines.

●

RECENT SWITCH IN CAB THINKING as to urgency of adopting new performance rules for jets and turboprops could have far-reaching effects. Board staff proposal, requiring industry comment by October 15, could wipe out results of year-long effort by CAA and industry to set equivalent safety standards for turbine transports.

Industry concern is two-fold. For one, Board's Bureau of Safety Regulation has assumed broad responsibility in developing new performance principles for jets in the face of smooth-running CAA-industry certification program.

And secondly, it has attached an element of timing to its proposal that is not immediately apparent. Proposed rules would be retroactive to all turbines but Viscounts, a feature associated with "emergency" regulations in CAB policy only since 1945.

●

CAB WILL BLANKET THE NATION within the next year with local service airline route cases. Major area proceedings are planned for northeast, southeast and southwest areas. These will be in addition to current proceedings which embrace Pacific northwest, mid-west states and Great Lakes areas. Each case will take about two years to complete.

Why CAB Issued NEA Ruling Prematurely

Five-year limit on award of New York-Florida route to New England-based carrier forebodes reopening of hassle in 1961.

By WILLIAM V. HENZEY

A closed-door ruling by the Civil Aeronautics Board August 2, favoring Northeast Airlines for a New York-Miami air route, ricocheted off Wall Street the next day and forced the agency into premature public revelation of its decision.

In fact, the Board's dilemma over the lack of secrecy at its secret sessions produced a new leak-stopping procedural device under which decisions will be announced immediately through a press release although formal opinions and official orders may be months away from completion.

The "press release" decision in the Florida Case confirmed Wall St. rumors that NEA had been given the coveted route award. A Board majority of Chairman James R. Durfee, Vice Chairman Joseph P. Adams and Member G. Joseph Minetti voted for NEA with Members Chan Gurney and Harmar D. Denny dissenting in favor of Delta Air Lines.

• **Award to Northeast** is for five years and authorizes service beyond New York to Philadelphia, Baltimore, Washington, Jacksonville, Tampa and Miami. Temporary tag was attached to the award because the Board feels NEA should prove the new route will free it of subsidy before a permanent license is granted. The action also assures a repeat performance in 1961 of one of CAB's most controversial cases.

But while Northeast was outwardly overjoyed at success in its long and turbulent struggle for a Miami route extension, the award to it was almost over-shadowed by events surrounding the case during the first ten days this month.

Because hearings in the Grand Canyon accident investigation occupied its regular working hours, CAB was forced to resort to night meetings to handle its regular business. First night session in the New York-Florida Case was held August 1. The following night, a decision had been reached.

Normally, the matter would then be turned over to the Board's opinion-writing experts and, after a month or so, a formal opinion and order would be signed, making the decision official. CAB anticipated following the normal procedure in the New York-Florida Case.

Another part of that slow-moving picture worthy of note is that only 300 shares of NEA stock were traded on the American Stock Exchange on Thursday, August 2.

But there was immediate reaction on the market the next day after word of CAB's Thursday night decision obviously filtered out of the secret session. On Friday, August 3, NEA stock activity amounted to 24,000 shares sold and the price per share jumped $3.50. By Wednesday of the following week, the volume of NEA stock transactions equalled one-fourth of the total volume for the entire year 1955.

Whodunit?

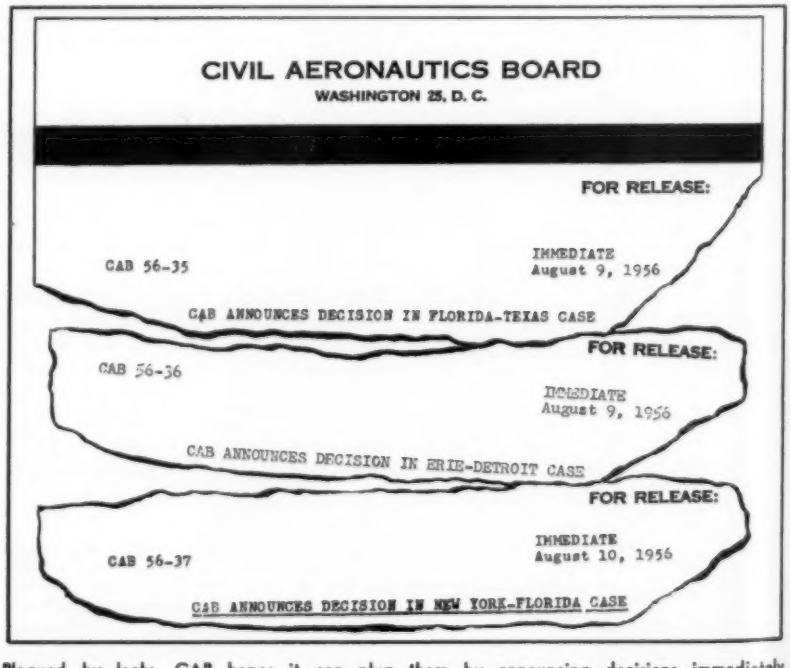
• **Rumors were rampant** as to who may have leaked the decision and who was cashing in on the market. Internal CAB discussions considered possible reference of the matter to the Federal Bureau of Investigation and/or the Securities & Exchange Commission.

But the only affirmative action readily apparent was the change in procedure to announce decisions as soon as they are reached. What pitfalls may be inherent in such a procedure remain to be seen. Only near-precedent was in February 1955 when the White House released President Eisenhower's decision in the Trans-Pacific Case before CAB had prepared an official order. Pressures mounted so in 48 hours in that case that the President reversed himself on important issues.

CAB hopes, however, that pressures will be minimized, if not eliminated by its new practice.

Until an opinion is available, detailed reasoning behind CAB's decision will not be known.

But these are some of the reasons behind the majority's support for NEA: First, the Board was impressed by the fact that New England has no "home-based" trunkline operating into other major areas, whereas virtually all other major U.S. areas are so blessed. Second,



Plagued by leaks, CAB hopes it can plug them by announcing decisions immediately through press releases. Above reflects the first three cases handled in the new manner. CAB officials liken their procedure to a Judge announcing his decision from the bench.

NEA is hopelessly subsidized under its present route structure and needs access to a productive long-haul route.

• **Written off** early in the case were New York-Miami bids of Pan American World Airways and Capital Airlines. Only strong contender was Delta. When the agency first considered the case, it voted 5-0 against the arguments of Eastern Air Lines and National Airlines that a third carrier is not required in the market.

Turning to the selection of a carrier, the 3-2 vote was cast for Northeast. The dissenting members—Gurney and Denny—then moved to certificate Delta between New York and Miami with a required stop at Atlanta. Supporters of NEA successfully contended that an estimated $1.9-million annual profit for NEA would be turned into a deficit if Delta were put in on a one-stop basis.

Other Complications

But as CAB was putting the results of those votes into a press release, new complications arose. At least two east coast syndicates were reported to be seriously interested in obtaining the 51% interest in NEA held by Floyd Odlum's Atlas Corp.

Odlum confirmed to AMERICAN AVIATION that offers had been made for his stock but stated emphatically that it was not for sale "to anyone." Finally, at 7 p.m., August 10, CAB issued its "presss release" decision with the hope of terminating the mounting tide of "reports," "stories," etc.

In addition to the NEA route award, the release revealed these additional route grants:

• **National's** east coast route extended from New York to Providence and Boston; restrictions lifted to permit shuttle service between New York, Washington, Baltimore or Richmond; Norfolk service restrictions lifted; and Fayetteville, Greensboro-High Point, and Winston-Salem, North Carolina, added as new points.

• **Eastern's** restrictions on service to New England lifted; shuttle service authorized between Tampa and Miami; and nonstop authority granted between Tampa and all points on New York-Miami route.

• **Capital** authorized to serve Norfolk and Newport News-Hampton-Warwick on flights also serving New York, Philadelphia, Baltimore or Washington.

• **Delta** authorized to provide one-stop service between Tampa and western points on Route 54.

• **United Air Lines** and **Trans World Airlines** authorized to serve Hartford/Springfield as an intermediate between New York and Boston and to serve Boston, New York and Washington, on the same flight, subject to long haul restrictions.

Lufthansa Selects Conways for Its 707s

Lufthansa's four Boeing 707-320 jet transports will be powered by Rolls-Royce Conway by-pass engines. Airline plans to use them for transatlantic service in 1960.

German carrier gave these reasons for buying the British engines:

Lower initial and operating costs; R-R's long jet experience and after-sales service reputation; lower installed weight permits 5,700 lbs. additional payload; by-pass engines' lower noise level and reduced fire hazard.

Other applicants in the case were Trans American Airlines, Riddle Airlines, and Resort Airlines. Their proposals were denied in their entirety by the agency. Technically, however, it cannot yet be said that the CAB decision is final. That must await issuance of a formal order. ◈◈◈

Trans-Texas Airways Air-Conditions DC-3

Trans-Texas Airways has come up with something new in DC-3 operation— a 7½-ton Freon air conditioning system that will give summer passengers in the 20-year-old Douglas transport a new lease on life.

In final tests before introduction into service a 70° cabin temperature was maintained on the prototpye airplane while outside readings exceeded 100°F, the airline reports.

Operation of the first aircraft began recently following issuance of a supplemental type certificate for the modification by CAA's 2nd region engineers at Ft. Worth. TTA officials believe it represents the first time in history that a completely air-conditioned DC-3 has been operated by a scheduled airline.

The airline plans to equip the balance of its fleet in a modification program beginning about November 1.

The TTA system, a joint development of its engineering department and a commercial air conditioning firm, will be marketed to other operators in kit form. The unit will carry a Trans-Texas manufacturing designation and trade name, as it was produced by the un-named firm exclusively for TTA.

The air conditioner compressor is powered by its own self-contained, air-cooled gasoline engine and operates from the DC-3's 90 octane fuel system. TTA engineers say fuel consumption runs about 1.5 gallons per hour.

The packaged unit, which can be installed in forward baggage compartments on the left or right side, weighs about 275 pounds. Finished installation is complete with fire detectors, plumbing from airplane's CO_2 system, temperature units and speed control.

Pilots Propose Steps To Ease Traffic Snarl

Seven recommendations for easing the air traffic control situation were issued by a special Air Line Pilots Association committee in the wake of the Grand Canyon collision. The Air Traffic Control Committee said the proposals were "immediately implementable and, had they been in effect, would undoubtedly have prevented" the TWA-United accident.

The proposals:

• Prohibit air carrier pilots from operating IFR in uncontrolled airspace.

• Eliminate 1,000-ft. "on top" clearance and institute all IFR above 9,500 ft. east of the 100° meridian (down through the center of North Dakota to Texas), and 14,500 west.

• Raise VFR minimums to 1,500 feet and five miles in controlled airspace; and elsewhere for air carrier operations to 1,500-3.

• Require control zones at all airports having instrument approaches.

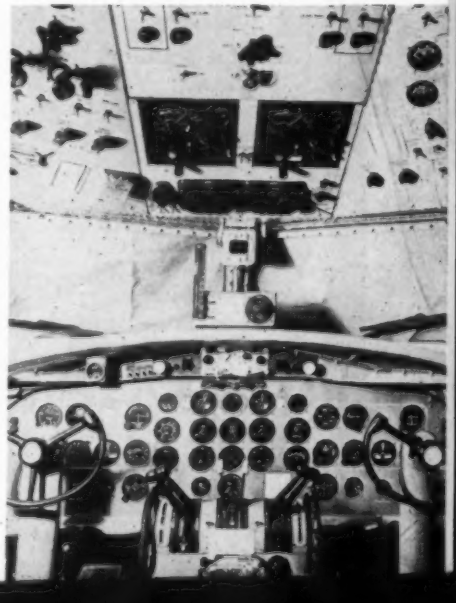
• Permit controllers to deny VFR traffic in a terminal where IFR approaches are being conducted.

• Eliminate VFR climbs and descents as part of IFR clearance.

• Implement speed control at all high density areas in all weather.

F-27 Front Office

First photograph of flight deck of Fairchild F-27 Friendship reveals simplified arrangements of instruments. Company says cockpit also provides "superior visibility," adjustable seats and adequate headroom.



CAB Limits Scope of Fare Probe

Civil Aeronautics Board has decided to limit the General Passenger Fare Investigation, instituted last May, to the general level of earnings of the domestic trunk airlines.

If in the light of such earnings the Board determines that the public is being charged too much (or too little), it will take "such across-the-board action as would bring the general level of fares and charges in line with the level of earnings determined to be reasonable," it said.

In its order defining the scope of the investigation, the Board noted that there had been many proposals which would have broadened the investigation. The Board rejected all of these proposals since, it said, "the primary aim is a major undertaking that will require at least a year to accomplish."

• **One of the real problems** considered by CAB was whether an overall percentage adjustment in the level of fares of some or all of the carriers would be economically feasible. The Board feels that it is. However, the order continued, the Board has not surrendered its discretion to investigate fare structures.

"As we view the case," the order read, "the question is not *whether* we shall explore the structural problems raised, but *when*. If at the conclusion of the general revenue phase of the investigation, or even earlier, we should decide that further investigation is necessary, we can reopen the record to take necessary evidence."

The Board explained that the reason for the investigation was "our concern, based on the level of earnings reported by most of the domestic trunks, over the possibility that the public was being subjected to excessive charges, overall, for passenger transportation." But the CAB saw no reason, "under present circumstances for making the local service respondents." Instead, the local lines were made parties to the proceeding as intervenors. Also named as an intervenor was the General Services Administration, which the Board noted, was the only "consumer" to request the right to participate.

CAB Orders Hearings On Foreign Holdings

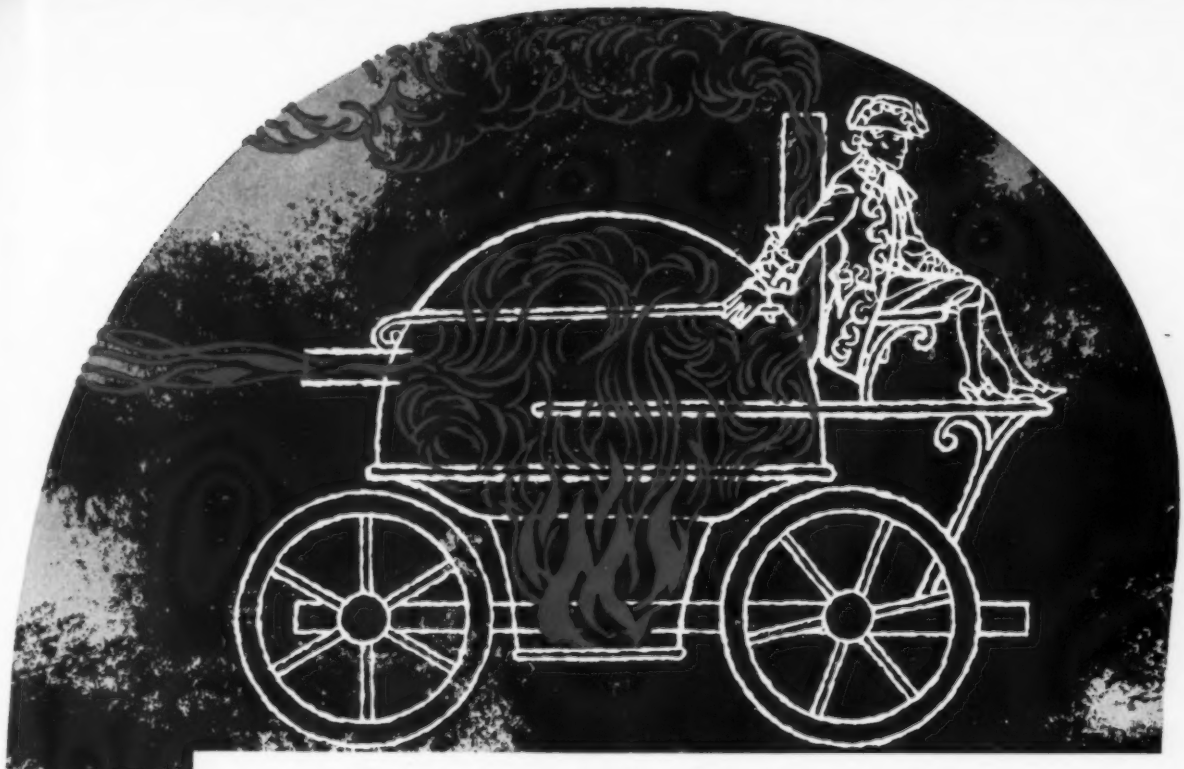
Civil Aeronautics Board has ordered further hearings in a test case designed to establish Board policy on the question of U.S. airline holdings in foreign air carriers. Case involves a Board investigation of whether Pan American World Airways has acquired control of Lineas Aereas Costarricenses, S. A. (LACSA) and whether such control should be approved.

The case was before CAB for final decision when new hearings were ordered. Largely responsible for the Board action was a switch in position by CAB Bureau Counsel in the final stages of the case. Originally, Bureau Counsel and a Board Examiner held that PAA had acquired control of LACSA and that such control should be disapproved as inconsistent with the public interest.

At oral argument, however, Bureau Counsel said it no longer felt the Board should disapprove PAA's holdings in LACSA. New interest expressed by the State Department and apparently other Government branches prompted the Bureau Counsel switch. CAB, therefore, felt it should get the benefit of the other Government offices views in public hearings.

Northeast's 'Curtiss Commuter' C-46

Northeast Airlines is using this 40-passenger Smith CW-20T (modified C-46) on its Boston-Burlington-Montreal operation. This is first C-46 type to go into scheduled service. Modern fire detection and extinguishing systems, more effective braking and automatic power loss detection devices are new features. Engines are P&W R2800Cs. L. B. Smith Aircraft Corp., Miami is modifying the C-46s.



s'Gravesande's Stoomwagen

s'Gravesande's Steam Reaction Car

In 1721 Jacob Willem s'Gravesande of Delft, stimulated by the recently enunciated Third Law of Motion, astounded the Royal Society by constructing a practical steam reaction car. The vehicle actually moved several times its own length, a distance of about two meters.

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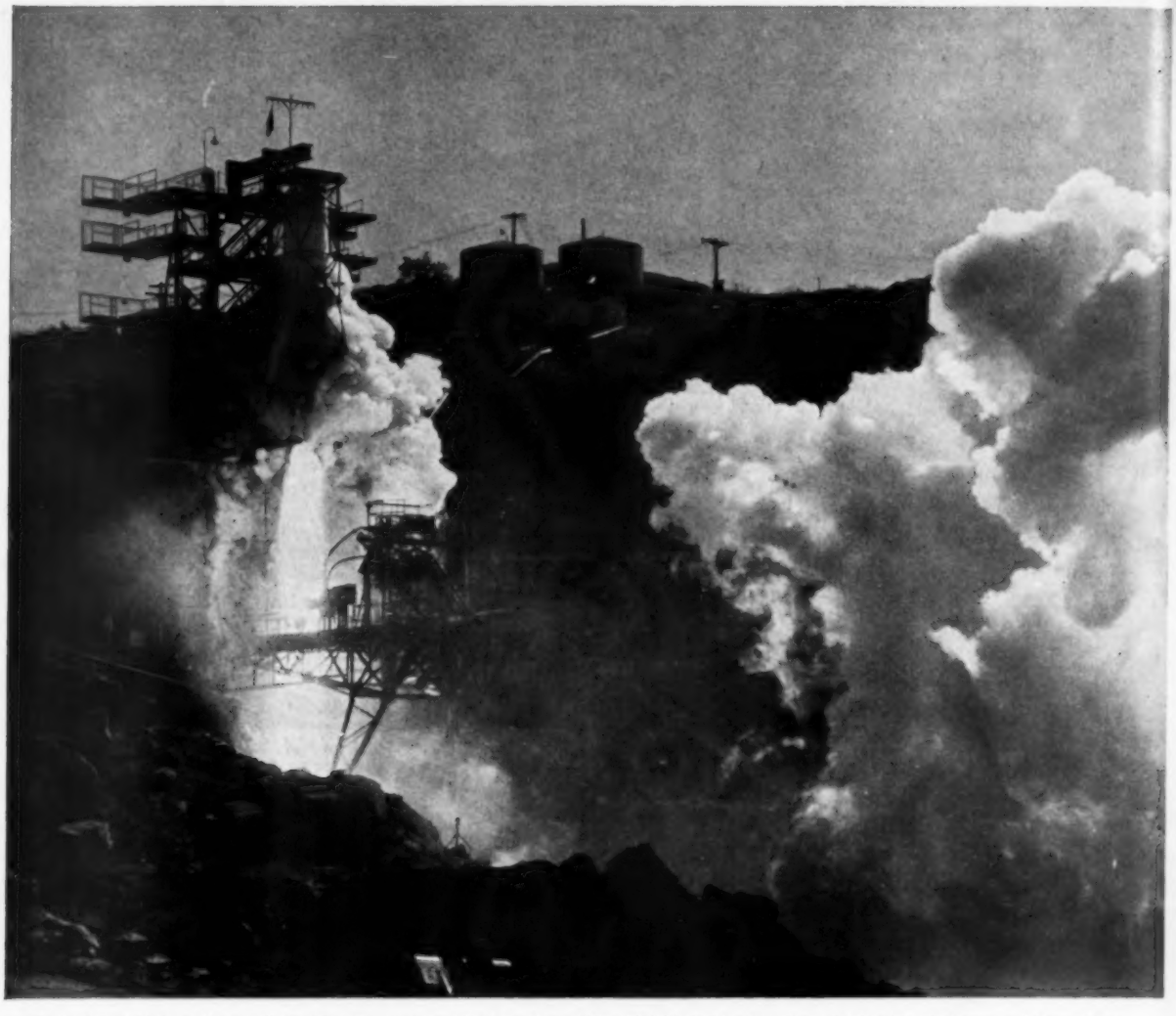

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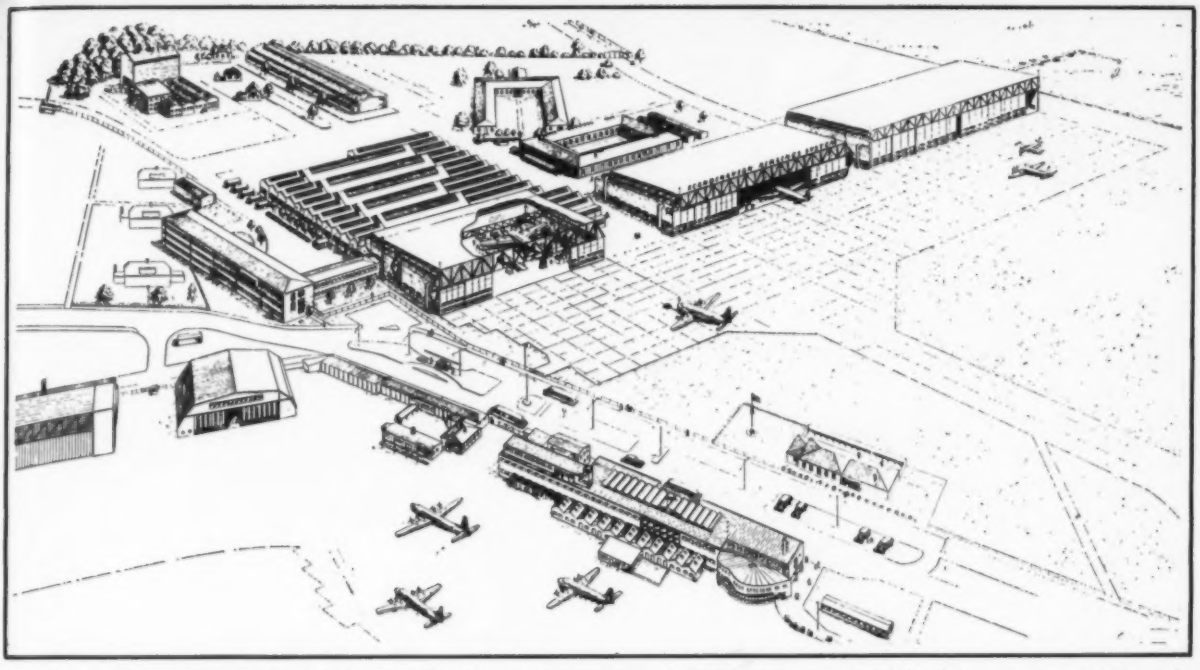

Three large hangars comprise heart of SAS overhaul base at Copenhagen. Workshops adjacent to left-hand hangar cover 64,560 sq. ft.

How SAS Made Overhaul Base Pay Off

By ANTHONY VANDYK

COPENHAGEN—"How to Turn a White Elephant into a Moneyspinner" might well be the title of the story of Scandinavian Airlines System's overhaul base here.

The facility almost became a white elephant as a result of the creation of SAS. When the three-nation airline became a going concern it found that three bases of its component airlines (Denmark's DDL, Norway's DNL and Sweden's ABA) provided far more capacity than a single carrier could use.

Consolidation was the order of the day, for it would have been ridiculous to have overhauled each type of aircraft operated in three different places. Political considerations prohibited the closing down of any of the three bases—Copenhagen, Oslo and Stockholm—but it was agreed to concentrate DC-6/6B work in Sweden, Scandia and DC-3 overhauls in Norway and DC-4 work in Denmark.

• **This decision** left the Copenhagen shops with little more than a handful of DC-4s to overhaul yet acres of space and hordes of skilled technicians on hand. Rather than close down part of the facilities and dismiss many of the highly trained workers it was resolved that business should be sought from outside Scandinavia.

Initially the going was tough but soon SAS found that plenty of business could be generated from a variety of sources. The airline's reputation was the best testimonial that SAS' sales engineers could offer as they roamed the world in search of customers.

Success of SAS' salesmen for the Copenhagen shops is evidenced by the fact that business has increased 700% in the last five years. Last year's turnover amounted to $2,700,000, about 85% of which came from foreign customers. A high proportion of the business is military—since 1949 SAS has overhauled over 600 military aircraft, many of them USAF planes.

Lots of DC-4 Work

• **Because** the Copenhagen shops specialize in DC-4 work it is only natural that most of the activity centers around this type of aircraft. Since 1952 the USAF has given SAS continuing contracts for C-54 overhauls and modifications. Most of the work has been IRAN, integral fuel tank sealing and stripping and the installation of nose radar. In some instances aircraft have been converted into "VIP" transports for Europe-based USAF "brass."

One of the Copenhagen shops' specialties is the fitting out of VIP aircraft. An outstanding job of this sort performed by SAS was the equipment of the president of Colombia's personal DC-4. (See photo.)

The Copenhagen shops do a lot of work for Colombia's Avianca airline on a continuing basis. It is a testimony to the high quality of the work performed that Avianca finds it worth while to "deadhead" the DC-4s across the Atlantic and back for overhaul when competitive facilities are available much closer at hand.

Colombia is not the only distant country that has used the SAS facilities. Aircraft registered in India, Thailand, Saudi Arabia and Greece have been overhauled at Copenhagen, not to mention those belonging to airlines in western European countries. Many carriers that deal with SAS' Copenhagen facilities do not actually send aircraft there for overhaul. These are the airlines that buy engines from SAS.

The Copenhagen organization is one of the few European concerns that purchase second-hand engines and resell them after reconditioning. SAS has complete facilities for overhauling P&W R-2000 and R-1830 engines.

Seat-Manufacturing Business

• **Another sideline** of the Copenhagen shops is the manufacture under license of Hardman aircraft seats. SAS is allowed to sell these seats to customers in the Sterling area. In the past four

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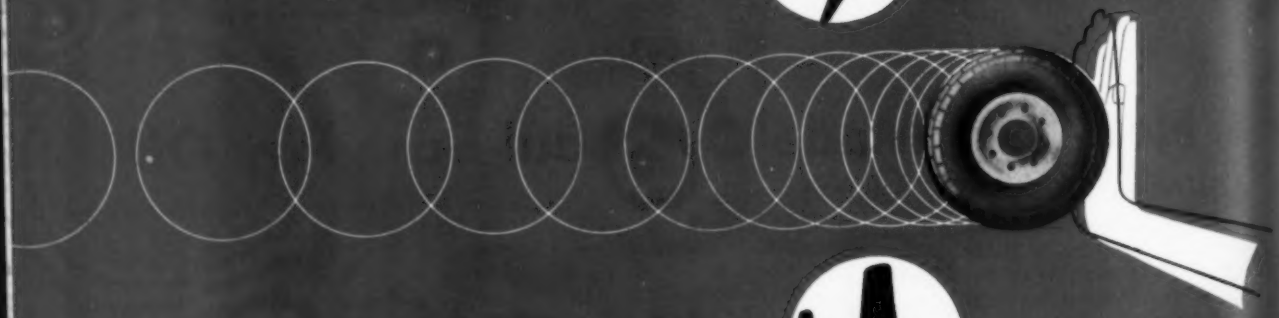

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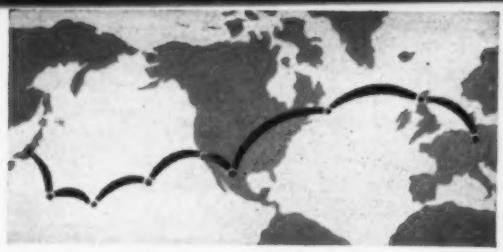

MATS Boeing YC-97J Operations Demonstrate High Performance of Propeller Type now in Production for Giant Douglas C-133A Transports

A USAF Boeing YC-97J turboprop aircraft, in operation with the 1700th Air Transport Group of the Military Air Transport Service (MATS), has set new records over both the Atlantic and Pacific Oceans—in tests that proved the precision control, smooth operation and long haul dependability of Curtiss-Wright Turbolectric propellers. In similar testing, the same MATS squadron kept two YC-97Js flying for a total of 46 hours, 35 minutes in a 24-hour period.

The high performance of Turbolectrics – the propellers specified for the giant USAF Douglas C-133A turboprop transports and for the major U.S. turboprop engines – is a result of precision control of engine speed and fuel reserves, through positive pitch change and close synchronization.

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Aircraft of many nations are overhauled by SAS at Copenhagen. This photo shows aircraft belonging to USAF, Saudi Arabian Airlines and Linee Aeree Italiane.

"VIP" interiors are a specialty of the SAS Copenhagen shops. This is part of the cabin of a DC-4 which was fitted out for use by the president of Colombia.

years it has produced about 3,000 Hardman seats and is now building an entirely new model for use in DC-7Cs. This DC-7C seat uses foam plastic that is more durable and much lighter, although slightly less elastic than the foam rubber it replaces. To improve the springiness, the seats incorporate special cut-outs on the underside and back. SAS says this makes them as comfortable as those made of foam rubber.

Employing 1,300 men and occupying three large hangars with more than 100,000 sq. ft. of adjacent shops and offices, the SAS Copenhagen facilities are approved by CAA and by Britain's Air Registration Board. They can take on overhaul work on almost any kind of aircraft, military and commercial.

SAS has had much experience in overhauling the Republic F-84 fighter and the Lockheed T-33 trainer. It has been handling these two jet models for the past four years.

The success of SAS's overhaul sales staff is such that at the moment there is a "wait list"—all space is taken up for the next four months. This is partly because most carriers prefer to have their aircraft overhauled during the slack winter months. The Copenhagen shops are least busy in the early summer months. With military and commercial business steadily growing as the result of customer satisfaction, the Copenhagen facilities are an increasingly valuable asset to SAS. ◆◆◆

CAB Extends NAL's Trans-Gulf Route

Civil Aeronautics Board has decided to extend National Airlines' trans-Gulf route beyond New Orleans to Houston for a three-year period. Decision was announced in a press release with a formal order and opinion to be issued at a later date.

Extension will permit NAL to operate through service between Miami, Tampa, New Orleans and Houston. All other applications in the case, known as the Florida-Texas Case, are denied, CAB said.

Eastern Air Lines, also an applicant in the case, immediately took issue with what it termed a "hasty decision" and said it will seek reconsideration.

CAB Charges Nonskeds With New Violations

Civil Aeronautics Board again has moved against the Trans American (formerly North American) combine with enforcement proceedings.

Trans American Airways (formerly North American Airlines), Hemisphere Air Transport, Twentieth Century Airlines, and Trans National Airlines are charged with exceeding in frequency and regularity their authority to provide air transportation.

Acting on the documented complaint of Robert Burstein, a compliance attorney, James Anton, Chief of the Compliance Office, filed against the large irregulars as individuals rather than as a combined organization.

In the complaint, Burstein pointed out that the Board had earlier revoked the Letters of Registration under which this group of carriers operated, and had ordered the group, either singly or in concert, to cease and desist from operating a frequent or regular service.

• **The carriers appealed** for review to the Court of Appeals for the District of Columbia, and most of the Board's order was stayed. Not stayed, according to Burstein, was the part of the order which required the carriers to stop operating regular or frequent services as individuals.

Burstein documented his case from the carriers' flight reports. In the case of Hemisphere, Burstein's record shows the large irregular operated at least one round trip each Sunday from January 15 through June 10, 1956. In all, for the five months, Hemisphere operated 150 New York-Miami flights.

Trans National, among other trips, operated a New York-Los Angeles flight each Sunday, starting with the first Sunday in October, 1955, and running through the last Sunday in June, 1956. During the same period, Twentieth Century was operating at least one New York-Los Angeles flight on every Thursday except two.

Burstein asked for immediate suspension of the carrier's Letters.

What CAA Plans to do About ATC Snafu

By JOSEPH S. MURPHY

Civil Aeronautical Administration's new Office of Air Traffic Control has launched an all-out campaign to ease the nation's ATC headache. Its first goal: to prevent a repeat performance of the June 21 east coast traffic snarl, a situation classed by airline officials as one of the most hectic in the history of airline operation.

On that day alone, Air Transport Association estimates some 30,000 passengers were inconvenienced at New York airports. One carrier reported that every single flight on its system was affected. Another said 70 of its flights were canceled outright and 77 others delayed at New York. The statistics are virtually endless.

What is CAA doing about it? Here's how OATC director D. D. Thomas describes the attack in an exclusive interview with AMERICAN AVIATION.

• **New Flow-Control Rules**—Orders have already gone out to regions limiting the use of traffic flow-control procedures to actual rather than forecasted weather conditions. Furthermore, they can only be resorted to when delays of 30 minutes are being experienced.

• **More airways**—New York area will get additional access routes equipped with VOR facilities now in the process of being installed. Final plan will call for two Philadelphia-New York routes instead of one at present; three routes from Wilkes-Barre, Pa. to New York instead of one; and additional routes for Boston-New York operations.

• **Better communications**—CAA hopes to double the number of direct communications frequencies now available—is looking into assignment of a set frequency to each route operation to cut down the need for repetitive frequency changing by pilots approaching the area.

• **Better radar utilization**—CAA at Indianapolis is now simulating radar procedures for the N.Y. area based on use of the new long-range radar which went into operation at Idlewild May 1. Plan is to expand radar coverage in the terminal area sector by sector in a program that calls for an increase of some 200 center personnel and 28 additional controllers in towers at LaGuardia, Idlewild and Newark combined.

One feature of CAA's program that will step up radar utilization and help the communication problem is a plan to use closed-circuit TV to relay to LaGuardia, Idlewild and Newark towers an actual picture of the center's radar display complete with aircraft identification markers.

D. D. Thomas

This will permit ARTC controllers to actally point out incoming traffic to each of the towers, and tower personnel to see not only the radar image itself, but also the controller's hand pointing it out.

• **In all,** Thomas figures that the New York area program alone involves $1,000,000 in hardware, not including funds for manpower increases needed to operate the expanded facilities. And although the effort is being concentrated at this point to alleviate a current traffic problem, virtually every phase of the program is considered a proving run for possible use at other locations thoughout the U.S.

As to timing, Thomas now looks for a large share of the improvements to be installed and operating by December 1, some phases about January 1. But he is somewhat apprehensive as to what it will mean in completely solving the ATC problem. He points out, "every time we find a way to handle five more aircraft, there are ten freshly manufactured flights ready to fill the gap."

In addition to the immediate change in field instructions on handling flow-control procedure, Thomas is taking a longer-range look at this problem to arrive at some realistic approach to the problem.

Although such a study was on Thomas' docket when he took over the ATC post, it gained new significance as a result of the June 21 traffic dilemma.

To speed an answer, a five-man CAA-military-industry group is already under way with an overall study of flow control in a project which Thomas estimates will take some three to four weeks. This task force, headed by Roys Jones of the new ATC procedures division, includes representatives from the Air Force, Navy, ATA and National Business Aircraft Assn.

Plan is to study traffic problems at about five key locations in the U.S. in attempting to arrive at a realistic flow control answer. A second assignment to this group is a study of present methods of allocating traffic once flow-control is established to meet a traffic situation.

In analyzing the events of June 21, ATA noted that the traffic restrictions used that day bore no relationship to traffic scheduled or planned, and did not represent a realistic or equitable distribution.

Actually, this matter of flow-control proved the key to June 21 tie-up. Washington ARTC, at about 2:15 a.m. on that day, instituted flow-control effective at 6 a.m. The result was a "chain reaction" in traffic restrictions that lasted for the next 14½ hours.

At the mid-day peak, Washington ARTC had to stop all traffic destined for Washington and Andrews AFB because of delays running up to 1½ hours. New York was experiencing inbound delays up to 80 minutes. LaGuardia 40 to 50 minutes. Departures were running 30 to 40 minutes late, up to 50 minutes for flights departing for the west and southwest.

Best index of New York traffic congestion was the record 12,000-plus flight progress strips handled by ARTC. Yet airport traffic was "light"—LaGuardia handled only 611 flights, Idlewild 413 and Newark 349 that day.

But even the new rules on flow control use by controllers may not be the answer.

In the short time since they have been in effect, Thomas says, he is already getting complaints from operators. Perhaps the five-man task force will come up with a better answer.

In any event, regardless of the success or failure of immediate "crash" measures, aircraft operators can now look for more positive CAA action on air traffic control problems. For the first time, CAA has a single office whose sole job is ATC.

And, it has a $246-million facilities plan to work with, one that should go a long way toward eliminating the bottlenecks that have made air traffic control the problem it is today. ◆ ◆ ◆

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TRANSPORT BRIEFS

• **William Kloepfer, Jr.,** is new chief of CAB office of congressional liaison and public information, filling vacancy left when Rod Kreger resigned two months ago in protest over reinstatement of Edward E. Slattery as public information chief.

• **Robert B. Murray, Jr.,** Pan American World Airways vp, has been transferred from New York to San Francisco to coordinate Pacific-Alaska Division activities in promoting tourist travel, hotel projects and airport improvements for jets.

• **Customs Commission** introduces simplified baggage declaration form at all points of entry except from Mexico this week. New form is devoid of "legalese." It is first revision in 50 years.

Local Service Lines Win Route Extensions

Three local service airlines have been granted new five-year route extensions in a "press release" decision in the Erie-Detroit Service Case announced by the Civil Aeronautics Board.

Allegheny Airlines has been authorized to operate beyond Erie to Detroit; Mohawk Airlines has been extended beyond Buffalo to Erie and Detroit; and Lake Central Airlines has been authorized to operate beyond Youngstown to Erie.

The awards will be made final when a formal order and opinion are issued in the future.

Facilities

Pratt & Whitney Div. of United Aircraft Corp. is examining sites in several states, including Florida, for possible location of a new auxiliary jet engine plant.

Douglas Aircraft Co. so far this year has authorized $34 million in capital expenditures for new facilities, including $20 million for the DC-8 final assembly plant now under construction at Long Beach. The new funds increase Douglas' expenditures for facilities since Korea to $74 million.

Ramo-Woolridge Corp. has broken ground for a 140,000-sq. ft. facility near Denver for production of electronic systems and housing of development and liaison facilities. Completion is scheduled for mid-1957.

Keithley Instruments Inc., manufacturer of electronic test instruments, has occupied new and enlarged facilities at 12415 Euclid Ave., Cleveland, O.

Aviation Power Supply Inc. has moved into a 12,000-sq. ft. addition to its engine overhaul shop at Burbank, Calif.

Olin Mathieson Chemical Corp. will construct a $36-million plant at Model City, N. Y., near Niagara Falls, for production of a new high energy chemical fuel for use in USAF missile and aircraft engines.

SUMMARY OF U.S. AIRLINE TRAFFIC FOR JUNE 1956 VS. JUNE 1955

Compiled by American Aviation Publications from Official C.A.B. Data.

Airlines	Revenue Passengers June 1956	Revenue Passengers June 1955	% Change	Revenue Passenger Miles (In Thousands) June 1956	Revenue Passenger Miles (In Thousands) June 1955	% Change	Total Ton-Miles Rev. Traffic June 1956	Total Ton-Miles Rev. Traffic June 1955	% Change	% Available Ton-Miles Used June 1956	% Available Ton-Miles Used June 1955
DOMESTIC											
American	743,822	679,407	9.5	482,035	408,661	18.0	53,900,563	46,979,870	14.7	65.12	63.29
Braniff	156,538	141,416	10.7	64,926	53,139	22.2	6,948,862	5,677,079	22.4	58.22	56.49
Capital	281,362	241,228	16.6	98,630	77,058	28.0	10,163,406	8,189,090	24.1	50.02	47.15
Continental	62,504	*	....	23,005	20,255	13.6	2,411,910	2,149,987	12.2	48.39	48.68
Delta	208,951	176,884	18.1	98,416	78,499	25.4	10,640,517	8,547,397	24.5	60.40	62.34
Eastern	671,019	547,955	22.5	321,922	261,711	23.0	35,057,539	28,863,388	21.5	51.05	51.70
National	105,916	89,762	18.0	69,511	60,396	15.1	7,729,785	6,698,540	15.4	71.75	67.29
Northeast	59,985	55,589	7.9	12,095	11,255	7.5	1,149,602	1,091,291	5.3	60.20	57.43
Northwest	134,938	127,216	6.1	95,148	87,755	8.4	10,570,429	9,769,664	8.2	61.52	61.03
TWA	398,113	359,596	10.7	325,037	286,154	13.6	34,512,587	31,093,830	11.0	69.61	65.82
United	618,875	518,141	19.4	446,730	366,819	21.8	50,180,125	41,871,391	19.8	66.38	64.47
Western	97,638	95,378	2.4	49,824	46,963	6.1	5,214,650	5,004,369	4.2	62.23	56.23
TOTALS	3,539,661	3,032,572	16.7	2,087,279	1,758,665	18.7	228,479,975	195,935,896	16.6	61.80	60.37
INTERNATIONAL											
American	11,202	10,578	5.9	7,699	7,003	9.9	1,098,755	965,014	13.9	65.96	66.25
Braniff	2,610	3,059	—14.7	5,785	7,170	—19.3	742,246	924,218	—19.7	54.44	51.50
Delta	4,851	4,320	12.3	5,855	5,062	15.7	648,670	578,882	12.1	51.91	43.30
Eastern	27,335	17,469	56.5	34,982	24,401	43.4	3,862,646	2,703,179	42.9	64.31	63.77
National	8,843	8,210	7.7	4,476	4,292	4.3	501,681	493,305	1.7	48.08	47.85
Northwest	11,309	9,825	27.8	22,489	20,163	27.4	4,261,276	3,619,238	27.8	73.16	68.34
(Hawaii)	1,246	.....	....	3,200	.....	....	365,133	.....	....	68.34	....
Panagra	11,399	10,714	6.4	13,146	12,328	6.6	1,775,277	1,572,377	12.9	56.07	53.13
Pan American											
Latin Amer.	104,502	82,832	26.2	103,414	84,257	22.7	13,217,914	10,948,503	20.7	62.68	63.42
Atlantic	102,921	90,658	13.5	135,053	122,609	10.1	16,675,405	14,954,685	11.5	60.45	70.43
Pacific	29,597	22,003	43.3	83,784	66,612	33.5	10,875,882	9,056,866	25.8	73.81	71.87
(Seattle-Portland-Honolulu)	1,927	.....	....	5,166	.....	....	518,437	.....	....	69.04	....
Alaska	8,890	8,741	1.7	9,851	10,422	—5.5	1,459,598	1,452,791	0.5	63.35	51.85
TWA	31,132	27,062	15.0	83,119	73,427	13.2	10,150,994	9,051,497	12.1	71.01	72.50
United	12,380	9,767	26.8	30,711	24,242	26.7	3,307,338	2,638,137	25.4	80.57	75.51
TOTALS	370,144	305,238	21.3	548,730	461,988	18.8	69,461,252	58,958,692	17.8	65.70	67.00
LOCAL SERVICE											
Allegheny	42,425	37,771	12.3	7,142	6,041	18.2	712,823	599,378	18.9	47.92	51.41
Bonanza	11,650	9,101	28.0	2,562	1,885	35.9	256,652	191,059	34.3	44.86	38.96
Central	9,441	8,131	16.1	1,746	1,276	36.8	178,491	131,226	36.0	32.22	26.01
Frontier	18,158	16,230	11.9	4,845	4,237	14.3	548,110	489,432	12.0	62.92	58.80
Lake Central	13,133	10,396	26.3	2,030	1,602	26.7	195,985	156,346	25.4	42.20	33.57
Mohawk	34,639	23,789	45.6	6,217	4,156	49.6	617,619	415,001	48.8	59.80	61.82
N. Central	55,817	43,972	26.9	9,467	6,936	36.5	947,051	703,975	34.5	52.38	48.93
Ozark	30,453	23,804	27.9	4,739	3,623	30.8	478,813	358,219	33.7	42.37	40.67
Piedmont	40,062	35,373	13.3	7,669	6,845	12.0	773,061	692,179	11.7	59.00	58.48
Southern	16,395	15,239	7.6	2,863	2,591	10.5	295,381	266,025	11.0	45.61	40.53
Southwest	24,147	25,254	—4.4	4,608	4,818	—4.4	460,795	486,763	—5.3	43.38	58.45
Trans-Texas	19,976	13,970	43.0	4,556	3,211	41.9	479,102	337,007	42.2	37.88	38.22
West Coast	20,342	18,950	7.3	3,582	3,253	10.1	335,333	309,920	8.2	54.93	50.81
TOTALS	336,638	281,980	19.4	62,026	50,474	22.9	6,279,216	5,136,530	22.2	48.93	48.39
HELICOPTER SERVICES											
HAS	.....	.....	....	.....	.....	....	2,755	2,536	8.6	44.26	42.60
Los Angeles*	.....	592	....	.....	8	....	.....	6,728	....	....	38.57
N. Y. Airways	4,373	2,368	84.7	82	48	70.8	10,492	7,373	42.3	66.87	51.62

* Not available.

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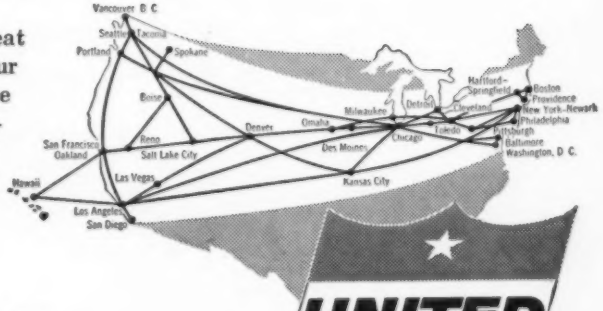

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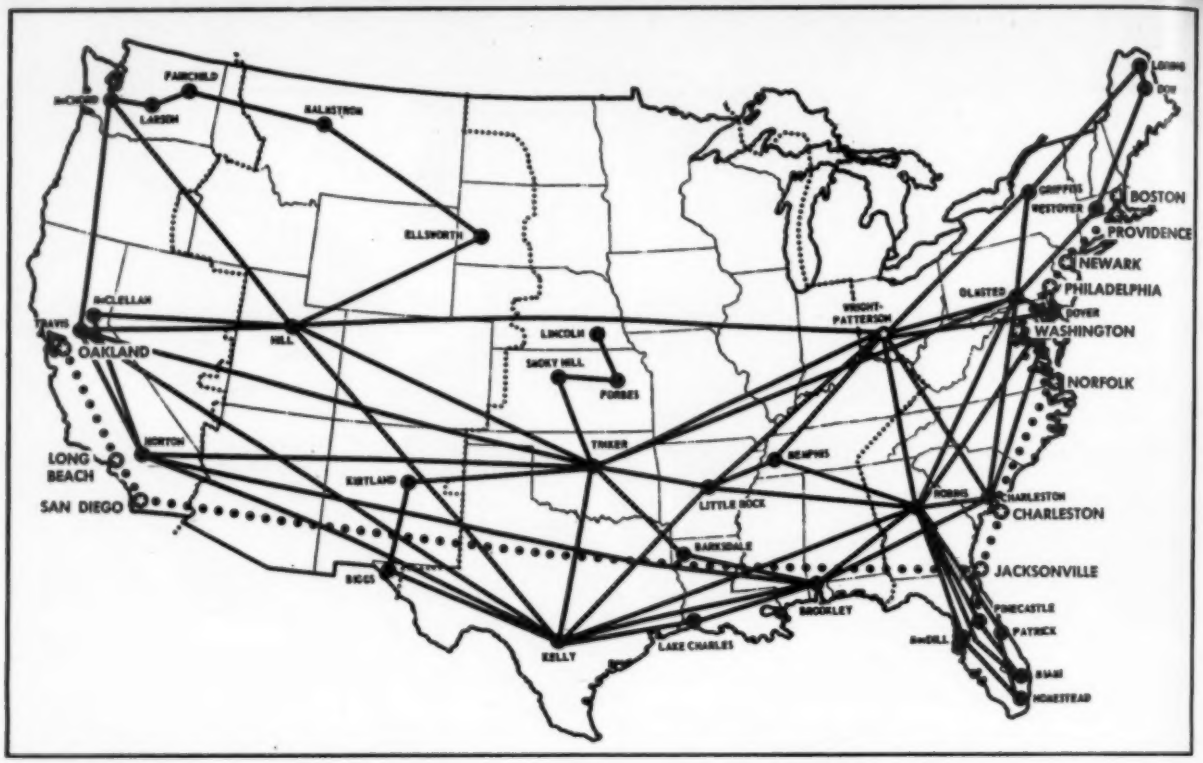

Military Contract Carriers Blanket U.S.

Commercial airlift contracts for the military, in the form of one-year cargo route awards to American Air Export and Import Co. (AAXICO), California Eastern Aviation, Inc., Capitol Airways, Resort Airlines and Riddle Airlines, cover most of the nation. In fiscal 1957, the carriers will provide cargo airlift of approximately 179 million ton-miles worth close to $25 million.

The contracts, running to June 30, 1957, fall into five distinct parts. Logair (of the Air Materiel Command) accounts for four; Quicktrans (Navy) is the fifth and is shown on the map by dotted lines and cities marked with stars.

The Quicktrans route, flown with DC-4s by Cal Eastern, provides for some 21 million ton-miles of cargo lift over a 3,460-mile operation between Oakland and Boston via various intermediates.

The five Logair contracts break down into: a transcontinental route flown by Resort with DC-4s; a transcontinental route flown by Capitol with C-46s; a C-46 operation by AAXICO between Air Force bases in the western half of the United States, and a C-46 operation by Riddle covering the eastern half of the U.S. The Mississippi is the dividing line.

The Logair contracts will produce about 157 million ton-miles—43.8 million from the Resort DC-4 trips, 113.2 million from the C-46s of AAXICO, Capitol and Riddle. The flights operate on a regular schedule. In past years, utilization of available space has been extremely high, usually above 85%.

Alaska Airline Profit

Alaska Airlines showed net of $154,559 on $2,685,511 operating revenues in six months ended Apr. 30, compared with $202,607 profit on $2,446,692 revenue in comparable period last year.

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Los Angeles Schedules		
Lv. Los Angeles (PDT)	8:30 am	8:30 pm
Ar. New York (EDT)	7:15 pm	7:15 am
Lv. Los Angeles (PDT)	8:45 pm	
Ar. Washington (EDT)	7:10 am	
Washington Schedules		
Lv. Washington (EDT)	9:30 am	
Ar. Los Angeles (PDT)	2:40 pm	

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ADVERTISERS' INDEX

Preview of Trip to Belgian Congo

To all of you loyal followers of this page, let me thank you most gratefully for the overwhelming interest you have shown in the series of articles on my journey to the Soviet Union which concluded last issue.

I went behind the Iron Curtain as a curious tourist. I applied for my visa in a routine manner in the spring of 1955 and when it was received last fall I wasted no time taking advantage of the opportunity. I traveled alone in the harsh northern winter. I'm no expert on the Soviet Union. I haven't tried to be. But if in a short trip of a few weeks I revealed something of the life and times behind the Curtain through my personal experiences, I consider the trip a success.

One amusing sidelight has been provided by Vernon A. Taylor of the maintenance department of Colonial Airlines (now EAL) who has long been active in flight safety. Vern sent to me a seat belt with a metal label inscribed "Iron Curtain Safety Belt for Wayne W. Parrish." (As you know, the Russians don't believe in seat belts.) On it was a big red star and other suitable trimmings. Bern tells me that Joey, the shoeshine boy who frequents the CAI offices at LaGuardia, donated the star from his leather jacket. Safety pins were donated by his wife (an ardent En Route fan), and horseshoe magnets were purchased at a local toy shop. The belt is one of my prize souvenirs and is on display in my office.

Meantime, my notebook on other trips and experiences have piled up. The USSR series ran far longer than anticipated. I still have to tell you about a fascinating day's flying with the helicopters of New York Airways and all of the local stops I've been hitting around the country. But first I want to tell you about a trip to Africa I made in June.

This was a long-anticipated jaunt to the Belgian Congo. Many have been the times that Sabena, the Belgian airline has invited me to see that fabulous country which sits astride the equator in the center of the big African continent. But my schedule is such that I could never set a date. The "right time" never seemed to come.

But one day last spring Stan Markusen, public relations director for Sabena in New York, reached me in Los Angeles to say that he had a special trip coming up for early June. There would be only six selected press people aboard. All arrangements for accommodations and ground transport in the Congo would be laid on. No fuss, no bother, just pack for the jungle and come along. The whole trip would take no more than two and a half weeks.

How could I say no to that? I couldn't. So late in May I took an excellent Sabena DC-6B flight out of New York for Manchester, England, and spent a busy week visiting aircraft and engine plants (and the Rolls Royce automobile plant) with AMERICAN AVIATION's Jim Stevens. I'll tell you about this part of the trip later. Then I hopped on BEA to Brussels and joined up with Stan Markusen and his party and headed for Africa.

Interesting Companions

It was a swell group. There were reserved, urbane Ted Patrick, editor of *Holiday* magazine; Max Lerner, the ever-soul-searching and mentally agile columnist for the *New York Post;* Bill Yates, the souvenir-hunting, conscientious travel editor of *The Chicago Tribune;* and Konstantine Kostich, the well-known photographer of New York. In Rome we picked up Frank Bartholomew, president of the United Press Association, a tall, wise and witty man who stood out in more ways than physical stature. It was quite a mixture of personalities, background and characters. But we got along fine. It was a wonderful trip.

Now that I'm back, I find it isn't easy to write about the Congo. A chronological description of the trip would be of little purpose. It is an utterly fascinating part of the world, yet it has so many different angles about which I am no expert at all. In a large sense it is a land of mystery. I've never been to any place like it. It is a land of the black man which the white man can penetrate only slightly.

The white man has built cities and towns, laid out roads, developed mining and other industries, erected thousands of homes for himself and natives. He has brought a semblance of the white man's civilization to mid-Africa. But alongside this skeletonized white man's civilization is a primitive way of life that has to be seen to be believed in today's world. And always present is that vast, ominous, tremendous Congo river with its endless tributaries snaking through the dense jungle as a constant reminder of the timelessness and power of nature in equatorial areas of the world.

Primitive Sights

Here's something of what I mean:

We would be driving in a new Ford along a road that might look like almost any other dirt road through a forest. Our minds might be on our offices or something going on in the U.S., or we might be just chatting among ourselves. Then we would pass an almost naked native or a Pygmy with a bow and arrow walking along the road. Hunting? Sure, but not for sport. He was out getting his daily food. A bow and arrow was his sole method of getting his means of sustenance. Primitive? Centuries old, and unchanged today. Yet we were seeing this from a new American-built car.

Or, as happened about three or four times, we would be driving along a road through the equatorial forest and up ahead we would spot some baboons. They travel in packs. Big ones and small ones, scores of them, moving from one side of the road to the other. We could never get too close to them, but they weren't in a zoo. They were in the forest as they've been for untold centuries. They constantly raid the native villages. They are ferocious, destructive pests.

In the Congo you are never very far, often only a few feet, from the stark realism of the ageless, cruel and encroaching jungle where the law of survival gets its most dramatic demonstration. There are frequent scenes of surpassing beauty and loveliness. There are entrancing views of snow-capped mountains on the equator. But you are also in a continent in ferment where millions of natives are awakening or being awakened and where many are in the process of adjustment to a new and more modern way of life. I know of no place where the extremes of life from the purely primitive to the most advanced are so intermixed in such close proximity.

The transition from Brussels to Leopoldville is swift. Sabena has an excellent overnight service of many flights to Leopoldville at the lower end of the Congo or to Stanleyville, 1,100 miles up the Congo. It was 4,032 miles to "Leo" by way of Rome and Kano, the vital airport in the northern part of Nigeria which serves many airlines between African points and Europe.

Sabena has a sizable network of DC-3 and DC-4 services through the Congo, but you won't see much of the country that way. You've got to drive and it's distinctly preferable to hire a car and driver and arrange accommodations in advance. Our party drove about 1,500 miles. I think you'll enjoy traveling over those roads with me in the land of dark-skinned natives, pygmies, wild animals and the outposts of white man's civilization.

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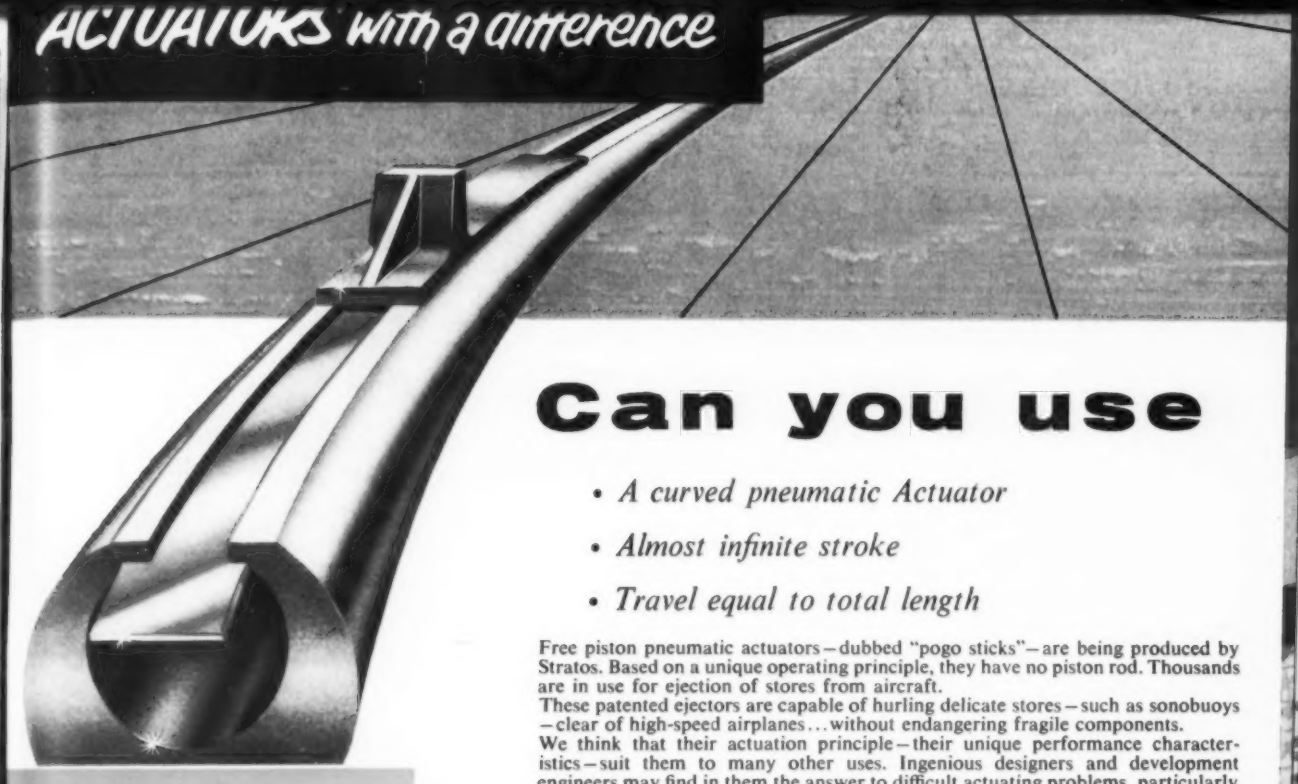

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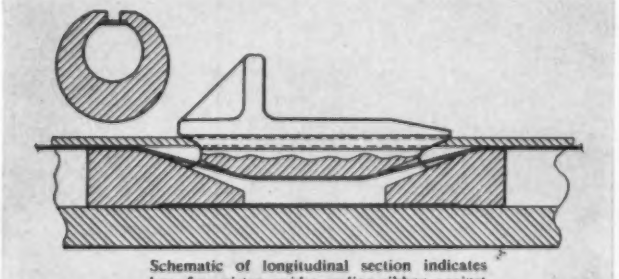

Schematic of longitudinal section indicates how free piston guides sealing ribbon against tube slot.

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